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Using Terra-cotta as Terra-cotta

By Eugene Clute



This is the second in a series of articles upon the craftsmanship of to-day, which necessarily must be subjected to a comparison with craftsmanship of former times.—EDITOR.

Photographs by Tebbs & Knell.



PARADOXICAL though it may seem, certain inherent advantages of terra-cotta have operated to its disadvantage. The moderate cost at which it can be produced and its great adaptability have caused it to play the rôle of a substitute for other materials, the appearance of which it has been made to simulate, and its own character has not been developed in our architecture, excepting in rare instances.

Used in its true character, terra-cotta adds much to the range of expression in materials available to the architect. It may be inexpensive or as costly as the principal enrichment of a fine building may well be. It may be very simple or it may be elaborately modelled and colored in polychrome with delicate variations of hue and texture.

Textures in terra-cotta should not be imitative of any other material, but should result from the manipulation of the clay in a manner natural to the method of production. As is generally known, architectural terra-cotta is made by working clay of suitable composition in a plastic state, then burning it in a kiln to give it hardness and durability. Usually it is formed by being pressed into a mould of plaster of Paris that is reinforced when necessary to withstand the pressure. This plaster mould is cast from a model that is made in clay, as sculptures are modelled, or from a plaster model. A clay model is used ordinarily for all designs excepting those that are moulded only in profile and can be run in plaster. The clay model is usually made from terra-cotta clay, which has more character of its own than sculptor's mod-

elling clay, inducing crisper, more vigorous modelling.

When, however, the design is not to be repeated, there is no occasion for making a plaster mould and the subject is modelled in terra-cotta clay of suitable composition and then fired. This gives the most interesting results, for there is no loss of refinement or sharpness of detail or of texture, and the artist is free to work without fear of producing too deeply undercut portions, which must be avoided when a mould is to be used. It is usually necessary to have models made for the ornament, whatever material may be used in its execution, and by this method the model becomes the detail itself.

The textures, then, that are natural to terra-cotta are those that may be produced in making the clay model, or in the moulded terra-cotta after it is formed and is no longer plastic but is still capable of receiving impressions, as from scoring or combing. Textures that are tooled in the plaster mould are less characteristic of terra-cotta, for they have the nature of carving in plaster—a harder, firmer material than clay. Excellent textures are also produced by such methods as wire-cutting, which gives a surface marked by fissures, similar to that of wire-cut brick. Textures in the nature of small-scale all-over patterns, preferably more or less irregular to avoid mechanical hardness, are desirable when the material is to be seen from such a distance that less pronounced textures would not carry.

The finishes obtainable in terra-cotta range from the unglazed finish to the glazed or enamelled finish, which is highly lustrous. Among the



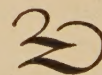
Second-story windows of the West Side Y. M. C. A. buildings, New York City, in which Dwight James Baum has used terra-cotta for its own sake in the transition from stone walls to the window-frame

innumerable finishes are excellent mat glazes and fine fire-gilded finishes, either mat or lustrous. There are numerous special finishes including, unfortunately, many that are imitative of other materials.

The glazes upon terra-cotta, like the glazes upon china ware and pottery in general, are vitreous; that is, in the nature of glass, burned on, firmly united with the clay body, hard and durable. The glazing substances are applied either by spraying or painting them upon the modelled or moulded terra-cotta before it is fired. In the kiln, they are fused and form the glaze.

The range of colors is almost unlimited, and delicate nuances and color variations are possible. In painting the colors upon the clay they can be toned and blended, and in spraying them they can be intermingled to produce very beautiful effects. For instance, a red can be produced that, when seen at close range, is made interesting and soft in effect by the distribution of mi-

nute particles of brown and of yellow; or a green may show a bloom of blue and yellow. Any desired color combination can, of course, be worked out in the same way. The best craftsmanship in terra-cotta is developing such methods of treatment as this, characteristic of the material, rather than following the common practice of borrowing the coloration and textures of other materials.



The best present-day examples of polychromy in terra-cotta show not only the results of an appreciative study of the work of the della Robbias and of other old European masters of the ceramic arts, but of the fine old Persian work and the marvellous glazed pottery of China and Japan, from which sources many refinements have been learned. This is a field in which the artist-craftsman of the present has a



The main entrance of Mr. Baum's West Side Y. M. C. A., where terra-cotta has been used in the splayed reveal with as much recognition of its intrinsic merit as that of the marble colonnettes in the lower part



A close-up view of the polychrome terra-cotta edging the door opening in the entrance shown on page 195. The colored glazes were applied by hand

distinct advantage over the Renaissance masters of the art, for he has much better technical facilities and the finest examples of the ceramic arts of the world are available for him to study, while the older workers had but few such examples. Also, what has been learned about color in the art of painting during the intervening centuries, and the advances that have been made in the scientific study of color, contribute to his superior equipment. It is safe to say that such beautiful effects in polychromy and in the handling of textures as are now seen upon the best terra-cotta could not have been achieved before our own day.

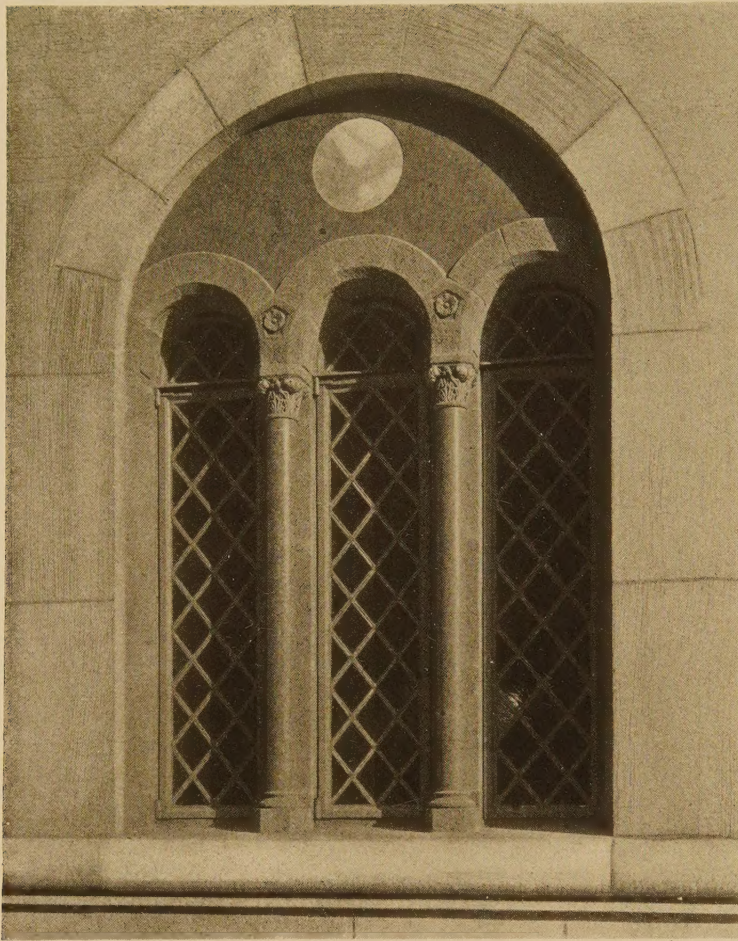
An example in point is the terra-cotta upon the new West Side Branch of the Young Men's Christian Association, New York City. Dwight James Baum was the architect, and the craftsmanship was under the direction of O. W. Ketcham. The terra-cotta on this building comes as a very pleasant relief from the predominance of mediocrity, perfunctory effort, and meaningless architectural gestures all about us. It arouses one's enthusiasm. Here is genuine work in the allied arts, not archæological, nor academic, and not marred by any forced effort to be original; and terra-cotta is used as the chief enrichment of the exterior—used intelligently, in its true character, combining the best old traditions and the best in modern practice with a knowledge of and due respect for the nature of the material and the technic of its production.

The most important architectural feature of the main front, on Sixty-third Street, is the great entrance, a tall arched portal enriched with polychrome terra-cotta set in plain, tooled stone, which acts as a foil to accentuate the loveliness of the terra-cotta. This ornament is in high relief, low relief, and in the round in different parts of this doorway and always it is admirable in scale, form, and color.

Typical of the care with which the terra-cotta upon this building has been designed and executed is the member of the doorway treatment that shows fruit motives bound by crossed bands at intervals. This decoration extends up both sides of the opening and follows the intrados of the semicircular arch. As the colored glazing substances were applied to this terra-cotta by hand, great freedom and expressiveness have been possible and, though the ornament repeats, the coloring upon the sections is varied. Various textures are used to accord with the design. On parts a gritty, dull finish has been



Detail at the springing of the arch, main entrance of the West Side Y. M. C. A., indicating the variety of color and form achieved in the terra-cotta, all of which gains greatly by reason of its setting in the limestone



Another detail from the West Side Y. M. C. A., in which marbles and terra-cotta have both been used, and each of equal importance in the restrained decorative scheme

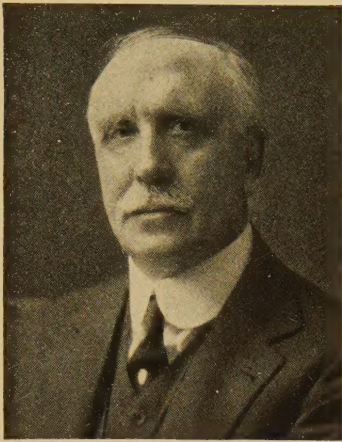


A close-up of the same window showing the marble colonnette, the stone sill, and the wire-cut terra-cotta

used, while other parts are accented by highlights upon a lustrous glaze. Unity between the terra-cotta and its setting of stone has been secured by the handling of colors and textures in the terra-cotta. The wide concave mortar joints, purple-brown in color, between the sections, play their part well, emphasizing the architectural and structural character of this ornamentation. This same mortar forms a line between the terra-cotta and the stone at either side of the detail, its dark color throwing the latter into greater relief and detaching it sufficiently to give crispness. The tooling of the adjoining stone in straight lines, not too regular or pronounced, affords a contrast for the curved lines and roundness of relief that characterize the ornament in terra-cotta. In the reveal of the doorway, square panels of polychrome terra-cotta, ornamented with conventional designs in low relief, are framed in plain tooled stone. This general method of treatment has been

carried throughout the portal and with the same consummate artistry.

The smaller doorway at the left of the main entrance, the entrance to the Boys' Department, is similarly treated, in a simpler manner in keeping with its lesser importance. The grouped windows in the first story afford an interesting study in the combination of materials. Here terra-cotta is used for the splayed reveals just inside the opening in the stonework, and for the splays upon the stone mullions, forming a background and foil for the columns of polished marble used in pairs, one green and the other red. This terra-cotta is of a rich, warm brown color in blocks that have wire-cut faces. Both color and texture are well chosen for the place. In the crowning feature of the front, near the level of the first setback, polychrome terra-cotta has been used effectively for accent against the brickwork of rich texture and warm brown coloring.



Charles D. Maginnis, F.A.I.A.

Maginnis and Walsh

By Rayne Adams

The second in a series of analytical portraits, in which Mr. Adams makes better known to us some of the outstanding figures in the architectural profession.

—EDITOR.



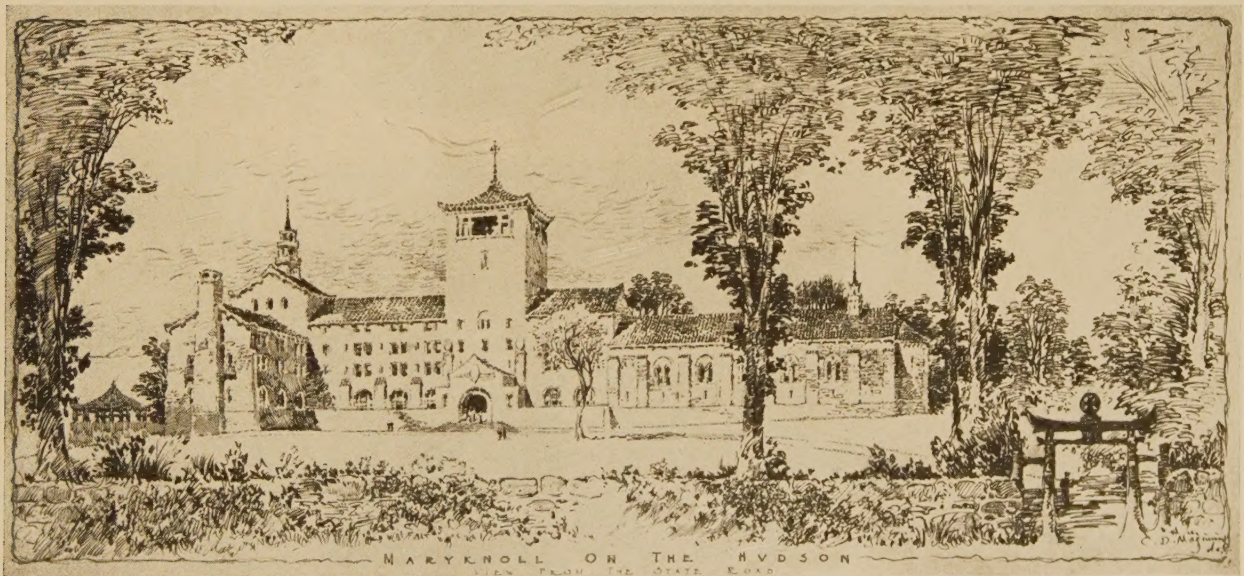
Timothy Walsh, F.A.I.A.

AN account, no matter how brief it be, purporting to indicate the way in which the architectural conceptions of Maginnis and Walsh are developed, should properly first call attention to the conjunction between their names. It is “and,” not “or.” This “and” implies something more than a cohesion of two individualities with distinct aptitudes. I must ask you to believe that while there are two minds behind the work of Maginnis and Walsh, yet there is only one; and that in spite of a likeness of aptitude and idiosyncrasy, yet there are two distinct personalities involved. It sounds a bit theological, doesn’t it? Whether or not it does so sound, the word “theological” affords a particularly good stepping-stone to use as a point of departure.

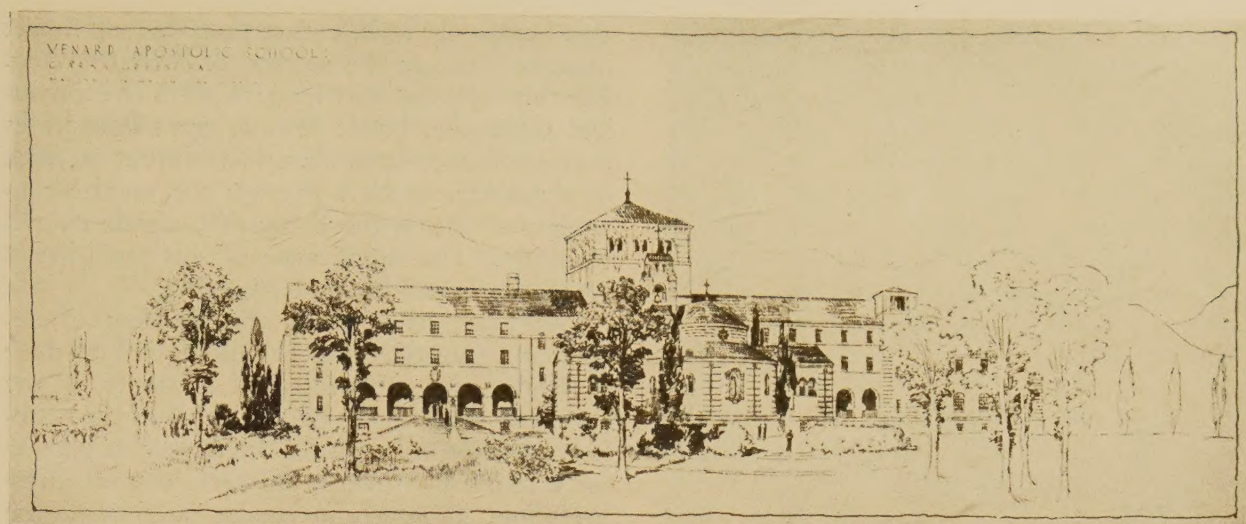
Charles D. Maginnis, as he himself records, was drawn to the Muse of Architecture by way

of his interest in pen-and-ink drawing. Many years ago he published an excellent book on this subject. Taken in conjunction with his skill in the use of pen and ink, this small book gives a clew to an understanding of Maginnis’s architectural predilections; it is, I am sure, the “picture” which always appeals to him.

In the welter of academic discussion concerning the proper matrix in which architecture should be born, the formula that architecture is a “picture” will seem inadequate to many. I hasten to add that I do not mean to imply that Maginnis accepts this formula; I do feel, on the other hand, that it is suggestive in understanding his attitude toward architecture. For the “picture” may be one of great complication and its significance is measured in terms of one’s imagination as well as his eyesight. Of course the jumping-jack of æsthetics, known as taste,



A preliminary pen-and-ink perspective by Charles D. Maginnis for the Seminary, Catholic Foreign Missions of America, Maryknoll-on-the-Hudson



Preliminary perspective by Mr. Maginnis, made before any drawings had been started in the drafting-room. Below, Mr. Walsh's subsequent water-color study of the same problem



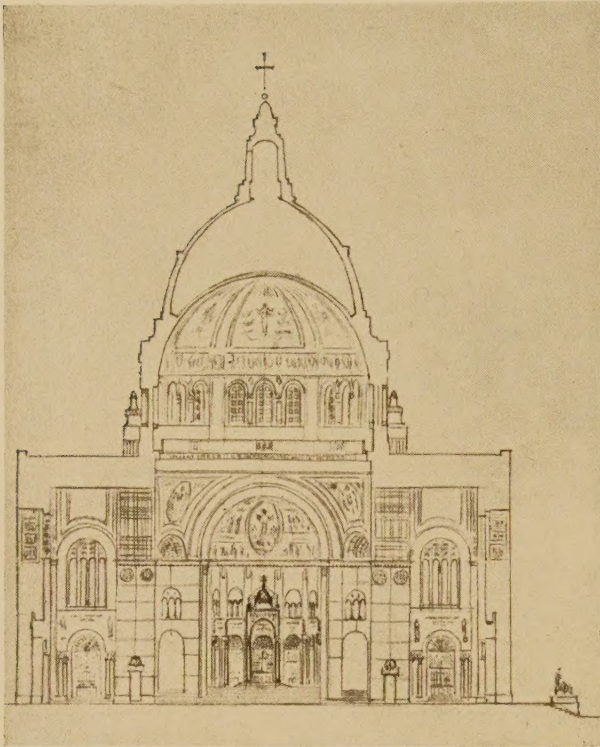
is always dressed in the robes of a presiding judge, and he passes upon the relative merit of all such pictures. And this jumping-jack never listens to our questions as to where he came from and where he is going.

Be that as it may, the "pictures" of ecclesiastical architecture in this country when Maginnis was a young man were generally unfit—save for those belonging to a far earlier date—to be hung in any salon. In this characteristic they did not differ from most of the architecture of that period. Interested in ecclesiastical architecture, Maginnis made a resolution to do what he could to better its estate. His aim was clear, and his resolution proved to be one of the moving causes which brought about the regeneration of ecclesiastical architecture.

At the time when Maginnis was, figuratively, putting on his armor, there happened to be another draftsman whose special abilities as a designer were developed in the stimulating office of Peabody & Stearns. Imbued with the same aspirations as Maginnis, Timothy Walsh embarked with him upon an architectural crusade, which, unlike the undertaking of Louis XI, was

both decorous and effective. Catholic architecture in this country, at the time when they began their practice, was largely inspired by the Gothic work of Europe, but churches were only too commonly erected with insufficient funds, so that, quite aside from the perfunctory quality of their design, they seldom realized the admirable integrity of the European prototypes.

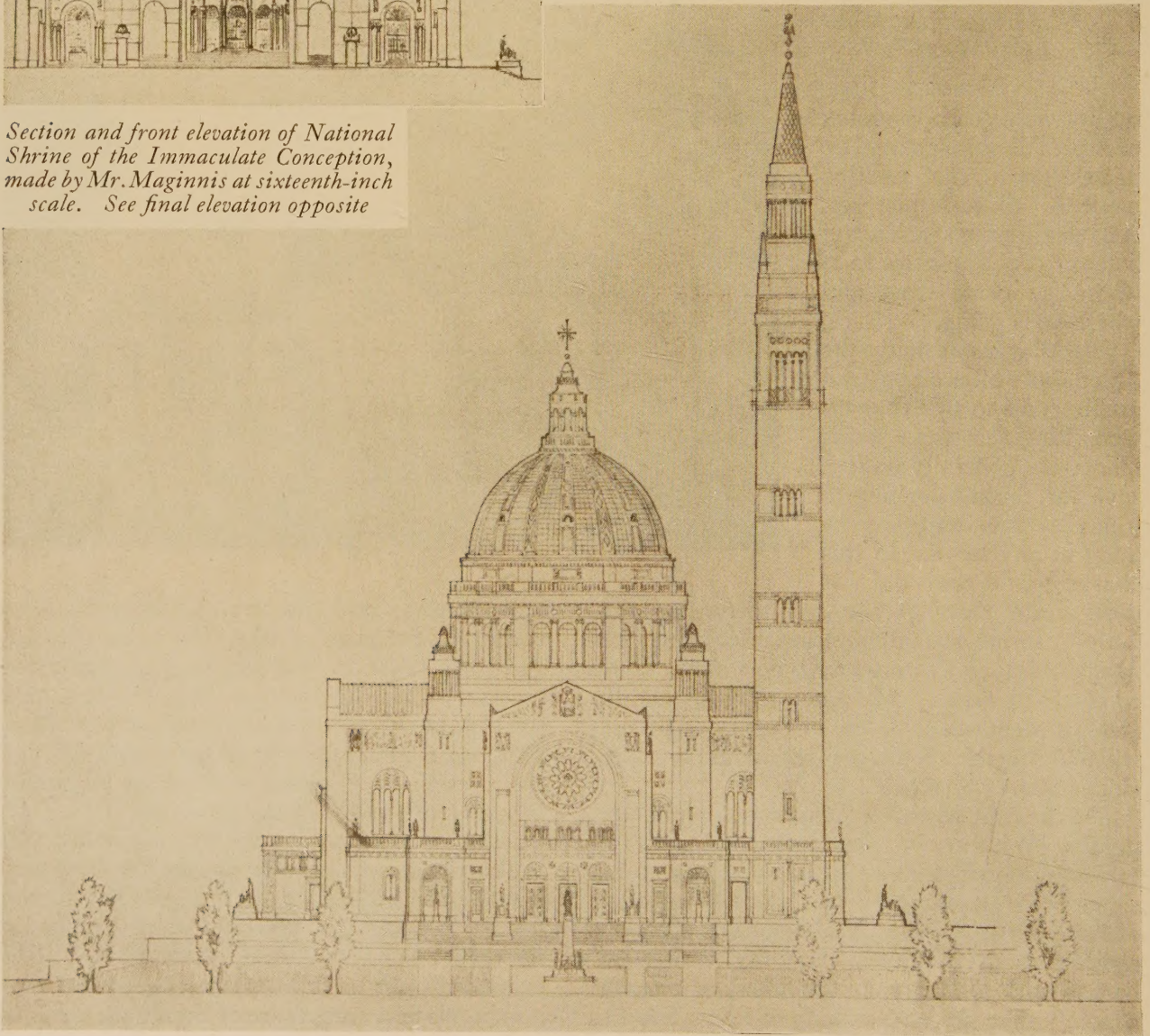
The innovation made by Maginnis and Walsh was so sensible that one may wonder why it was not made before their time. They turned to the Romanesque architecture of Lombardy for their inspiration. And, although they have expressed their work in other styles, I feel that it is in this first acceptance of the simple forms of



Section and front elevation of National Shrine of the Immaculate Conception, made by Mr. Maginnis at sixteenth-inch scale. See final elevation opposite

this Lombardy architecture that we may detect in some measure the method of their thinking. For this style not only lends itself to an economical expression, but it permits great freedom in the use of motifs and materials without sacrifice of character. And it permits the architect to work well within the limits of Catholic church tradition. The significance of this tradition is to Maginnis and Walsh compelling.

As Maginnis admits, the problem of designing a Catholic church building is half done to begin with; the essential elements of the *parti* are established. The solution of the problem calls not so much for originality of plan as for a sense of fitness in its architectural interpretation, in which an understanding of the archæological elements plays an important part. The limitations imposed by this special tradi-



tion are irksome only to those who do not accept the tradition. It is possible, in the designing of ecclesiastical architecture, that new forms may replace those now commonly accepted. Maginnis and Walsh hold the door open even to modernistic conceptions of design, though they do not themselves incline toward them, for the simple reason that these new forms are not endowed with the special significance which centuries of acceptance have given to the older forms. That there are certain fixed requirements in church design both Maginnis and Walsh feel assured. Accepting these fixed conditions, they exercise, within the limits imposed, a wide eclecticism in the expression of their architectural conceptions.

The exigencies of a large practice permit neither Maginnis nor Walsh nowadays to make

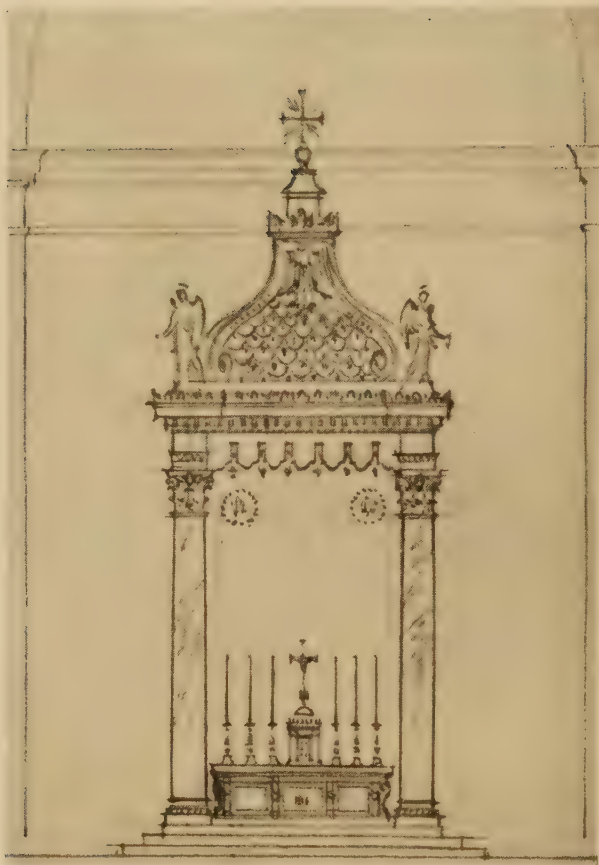
many drawings. And perhaps for this reason the uniformity of character and quality in their work is all the more noteworthy. It is not so difficult for the architect to have things quite his own way provided he make all the drawings himself. The only alternative is to have disciples. Socrates wrote little, or none at all, but he had an excellent disciple in Plato.

The procedure of both Maginnis and Walsh in their approach to the solution of a problem is very similar. Like most capable architects they visualize the building primarily in terms of its special requirements in relation to the surrounding conditions. Sometimes, as illustrated by the sketches on pages 200, 202, complete preliminary drawings are made by Maginnis or Walsh themselves. Often the sketches embodying the essential conception are far less complete.



A typical sketch by Mr. Maginnis made in critical consideration of a draftsman's detail drawing

Final drawing for front elevation of National Shrine of the Immaculate Conception, Washington, D. C., made in the drafting-room as a development of Mr. Maginnis's studies shown on opposite page

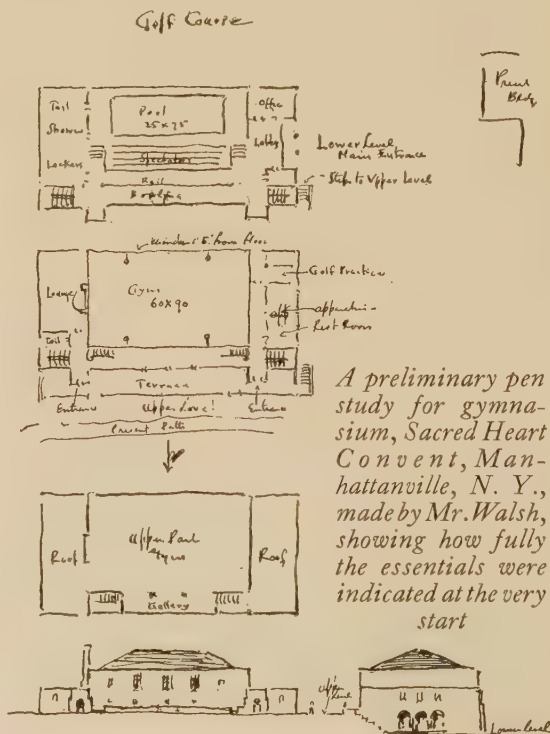


Mr. Maginnis's original pencil sketch, made at eighth-inch scale, for the High Altar and baldachino, Church of the Immaculate Conception, Waterbury, Conn., together with the finished work

Sometimes no preliminary sketches at all are made. How then, you may very well ask, are these particular conceptions conveyed to the draftsmen for development? Surely they require that something tangible be placed before them. The answer is, I am sure, an interesting one. Maginnis is able, to an extraordinary degree, to convey a pictorial conception by the use of words. Those with whom he works would be the first to acknowledge it. And thus the initial plunge which the draftsman takes in developing Maginnis's original conception may be inspired by a preliminary talk instead of a preliminary sketch—and who is to

say that one is not quite as interpretable as the other? That such verbal instructions can most

successfully be applied to specialized problems of more or less fixed *parti* is undoubtedly true. Yet it is possible that by the use of this method Maginnis obtains from his draftsmen more assistance of an imaginative order than is obtained when the reins are too tightly drawn. Under certain conditions Pegasus has been known to walk instead of flying, as he is supposed to do.



A preliminary pen study for gymnasium, Sacred Heart Convent, Manhattanville, N. Y., made by Mr. Walsh, showing how fully the essentials were indicated at the very start

The next in Mr. Adams's series of analytical portraits, to appear in the May issue, is one of Paul Philippe Cret, recently the recipient of the Bok Prize in Philadelphia.

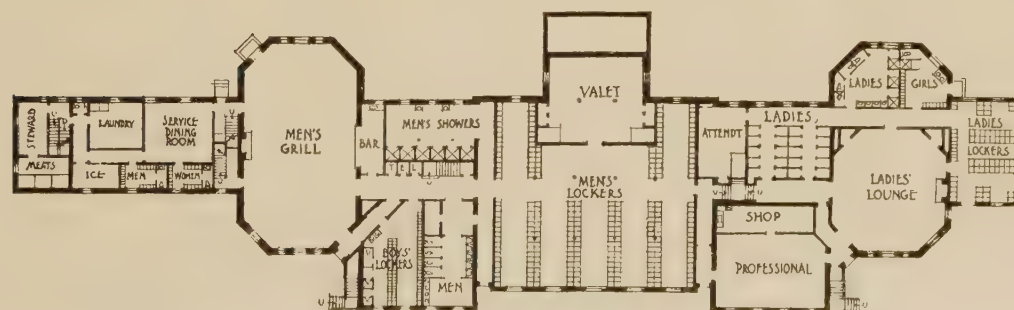
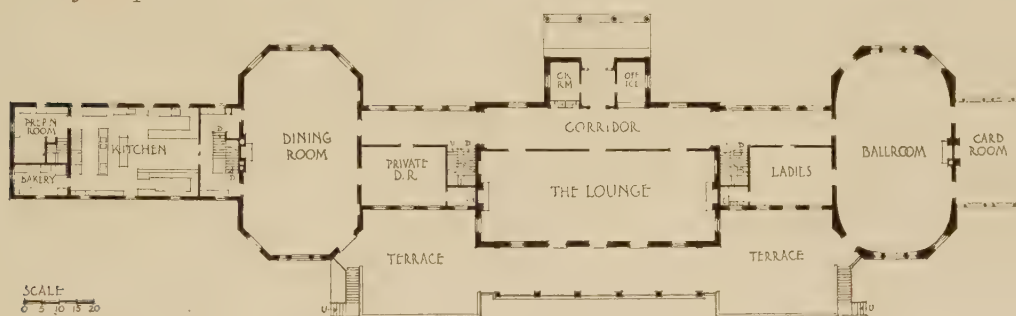


Photographs by Richard Averill Smith

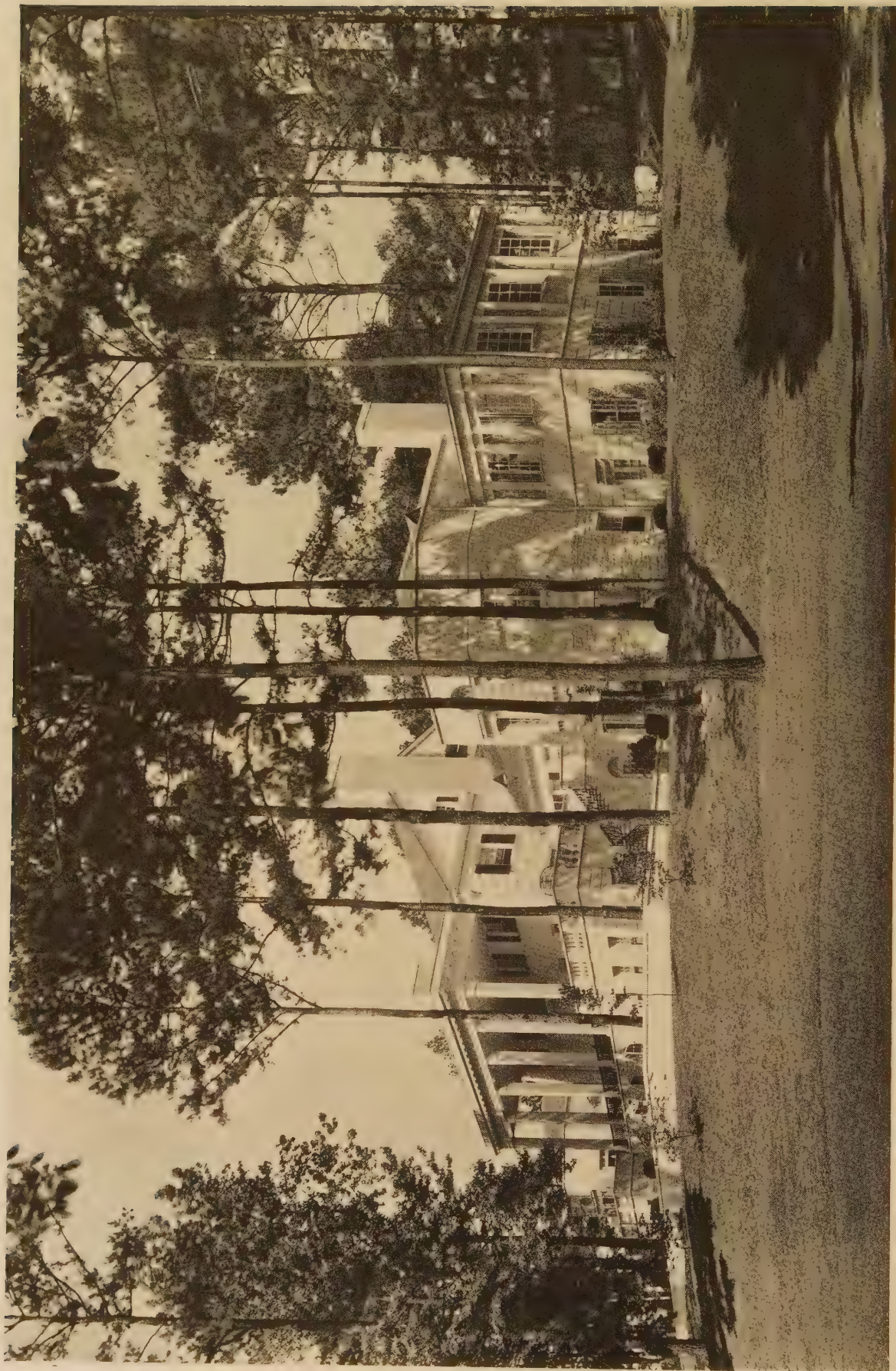
MOUNTAIN BROOK COUNTRY CLUB, BIRMINGHAM, ALA.

AYMAR EMBURY II, ARCHITECT; MILLER & MARTIN, SUPERINTENDING ARCHITECTS

First-floor plan



Basement plan



MOUNTAIN BROOK COUNTRY CLUB, BIRMINGHAM, ALA.
AYMAR EMBURY II, ARCHITECT; MILLER & MARTIN, SUPERINTENDING ARCHITECTS



MOUNTAIN BROOK COUNTRY CLUB, BIRMINGHAM, ALA.
 AYMAR EMBURY II, ARCHITECT; MILLER & MARTIN, SUPERINTENDING ARCHITECTS



The ballroom; floors, deep blue; wainscot, deep blue; trim, silver leaf; cornice, gold

MOUNTAIN BROOK COUNTRY CLUB, BIRMINGHAM, ALA.

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◀ ARCHITECTURE ▶



The ballroom

Dining-room fireplace

One end of the lounge



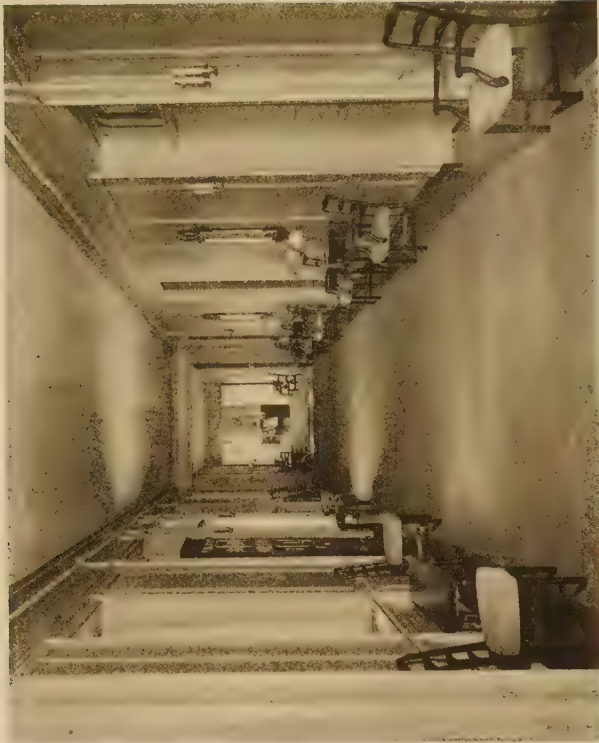
MOUNTAIN BROOK COUNTRY CLUB, BIRMINGHAM, ALA.

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◀ ARCHITECTURE ▶



*Entrance
and office*



*The
corridor*



*The
card room*



*Men's
grill*

MOUNTAIN BROOK
COUNTRY CLUB,
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ARCHITECT;
MILLER & MARTIN,
SUPERINTENDING
ARCHITECTS

The Seminary of the Immaculate Conception

HUNTINGTON, LONG ISLAND

ROBERT J. REILEY, ARCHITECT

By Joseph Johnstone Ott



Details of choir stalls; executed by William F. Ross & Company



Portions of sanctuary windows; executed by Charles J. Connick



Left, sanctuary lamp; executed by Edward F. Caldwell & Company



Wood carving on main altar; executed by Irving & Casson—A. H. Davenport Company

THE Seminary of the Immaculate Conception is the divinity school of the Catholic diocese of Brooklyn, and offers a six-year postgraduate course in philosophy and theology. Students remain in residence except during the summer months, and at that time the building is used by the clergy who gather together from various parts of the diocese for conferences. The number of students is limited to two hundred and fifty, and living accommodations, together with religious, educational, and recreational facilities, are provided.

A general glance at the exterior reveals a large composition in the centre of the main façade framing the principal entrance executed in richly carved limestone. On closer inspection we see that this vigorous carving is full of interesting symbolism. Immediately around the door is a vinelike ornament into which are worked various flowers, symbolical of the virtues, and above is the coat-of-arms of the Right Reverend Thomas E. Molloy, S.T.D., Bishop of Brooklyn, due to whose initiative, zeal, and perseverance the building was erected.

The materials used on the exterior are light-colored bricks, shading from buff to salmon, with some limestone interspersed with them, and red tiles on the roof. On the interior the

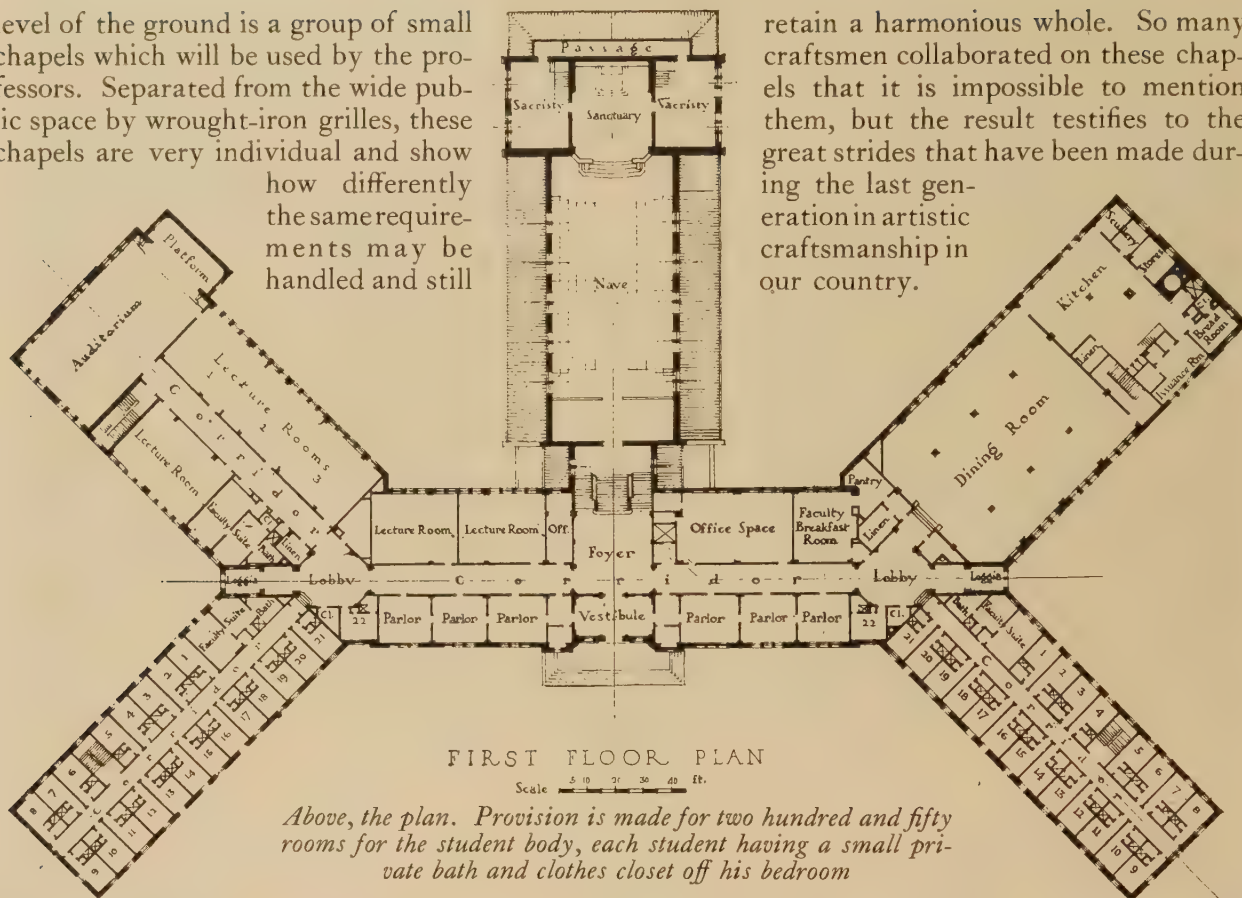
floor construction is of steel and concrete. As the Chapel is the centre of the life of the building, Mr. Reiley expended on it the greatest care in the hope that it might be an inspiration to youth and by its beauty raise the heart to God. It is reached by a wide flight of steps leading from the central foyer and, on entering, one is in the space provided for visitors. This space is separated from the choir by a beautiful wrought-iron grille (see March issue) in the manner of the wonderful *rejas* of the old Spanish cathedrals.

In the choir are the stalls for the faculty and the students who have received minor orders. These stalls rise in five tiers on either side of a wide central aisle. The high backs of the stalls have afforded place for carving out of solid blocks of wood the Stations of the Cross, a series of fourteen scenes from the life of Christ, starting with the trial before Pilate and ending with the burial in the tomb. The professors' stalls are emphasized by projecting canopies and the rector's stall is still further enriched. The sanctuary is raised a few steps, and on the left are the Bishop's throne and the chairs for the deacons of honor. But the great central feature which arrests the attention of the visitor is the altar, filling the entire end of the sanctuary.

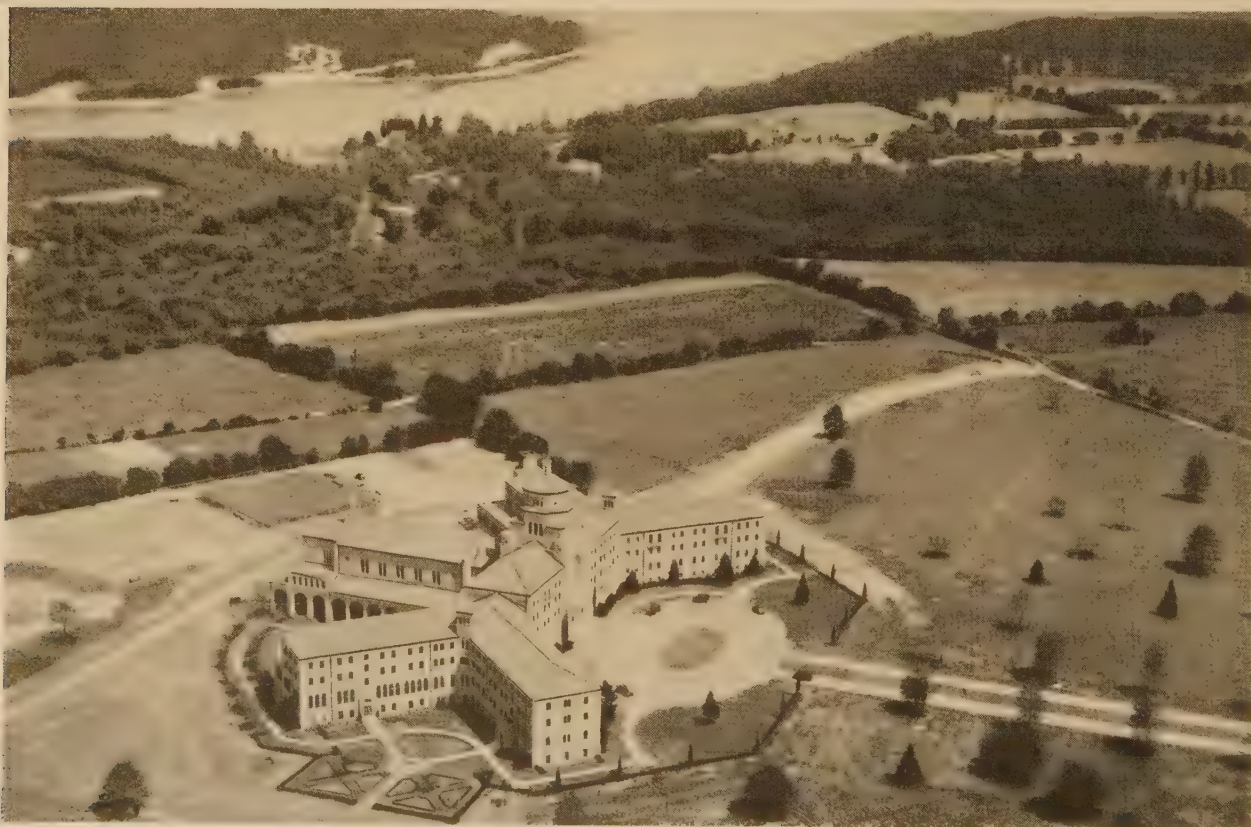
Under the main Chapel and directly on the

level of the ground is a group of small chapels which will be used by the professors. Separated from the wide public space by wrought-iron grilles, these chapels are very individual and show how differently the same requirements may be handled and still

retain a harmonious whole. So many craftsmen collaborated on these chapels that it is impossible to mention them, but the result testifies to the great strides that have been made during the last generation in artistic craftsmanship in our country.



Airplane view of the Seminary, showing one of the many bays off Long Island Sound in the distance



Photograph by Fairchild Aerial Surveys, Inc.



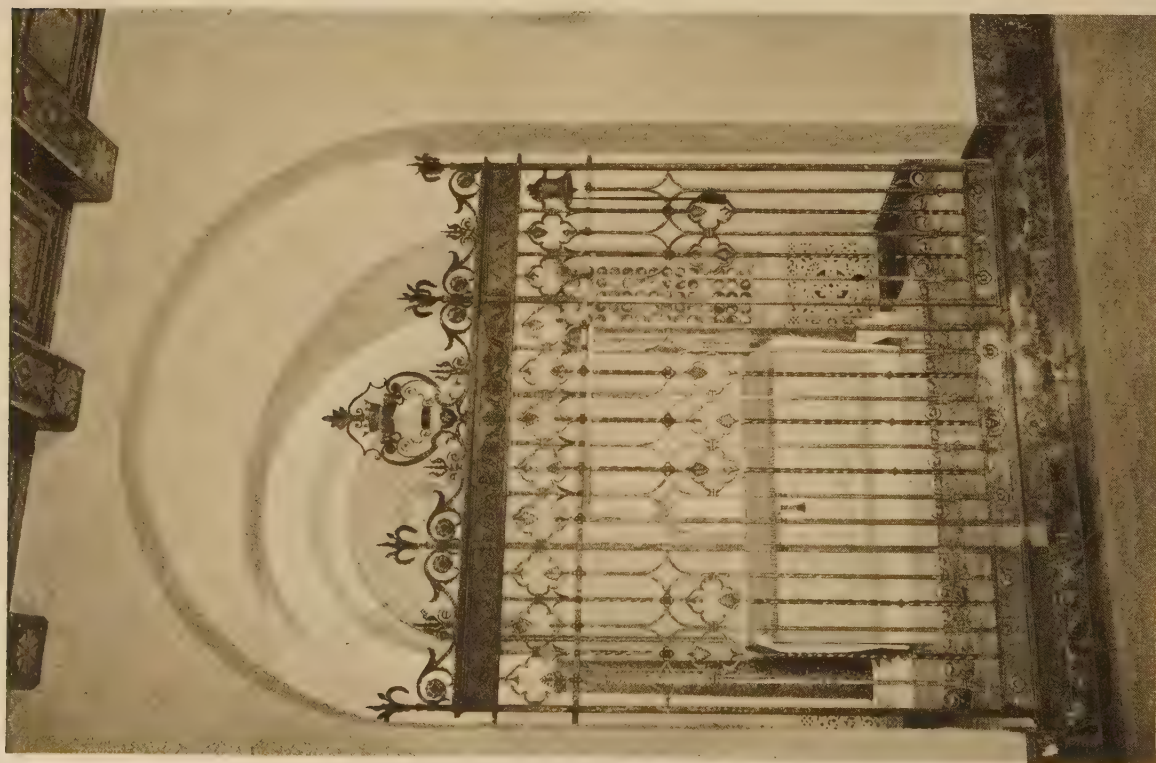
In the arcade extending around three sides of the Chapel wing, the brick is rather light in color, shading from buff to salmon. Limestone is the dominating material here



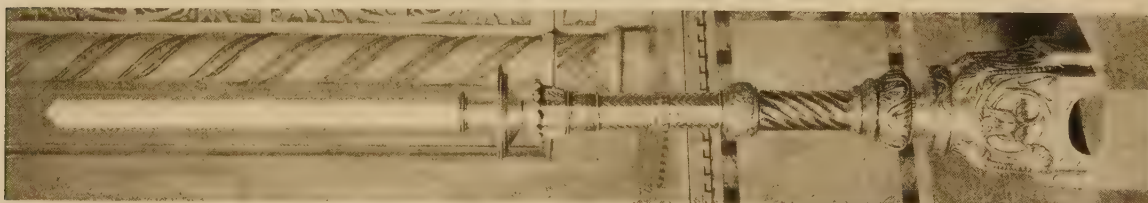
The Chapel, looking toward the entrance and the space reserved for visitors. In the choir are stalls for the faculty and for the students who have received minor orders. Wrought-iron screen executed by Ferro Studio, Inc.; the oak was carved by William F. Ross & Company



The Chapel, looking toward the altar. The canopied seats are for the faculty; in the sanctuary itself, rising a few steps, is the bishop's throne on the left, with seats for the deacons of honor



One of the wrought-iron gates (executed by Ferro Studio, Inc.) separating the minor chapels from the wide public space on the main axis below the main Chapel, on the ground level. There are twelve of these minor chapels—see pages 220-221



Sanctuary candlestick; executed by The Gorham Company



Detail of the altar in the Chapel. The crucifix and the whole reredos above the marble are of carved wood covered with gold leaf; executed by Irving & Casson—A. H. Davenport Co. Marbles of the altar cut by McGowan & Connolly



The statio below the main Chapel, from which open at both sides the small chapels used by the professors; see illustrations on the next two pages



The dining-room which, with its adjoining kitchen and accessories, occupies the whole of a wing



Shrine of St. Therese, The Little Flower



Shrine of St. Francis

*Some of the minor chapels built on the ground level below the main Chapel,
and utilized by the faculty*

Shrine of St. Joseph

Shrine of St. Thomas Aquinas



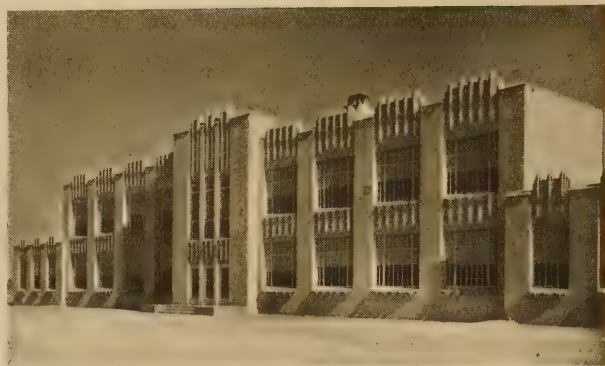
*Shrine of St. Paul**Shrine of Our Lady of Perpetual Help*

*Some of the minor chapels built on the ground level below the main Chapel,
and utilized by the faculty*

Shrine of St. Catherine of Alexandria*Shrine of the Sacred Heart*



The New York Hospital-Cornell Medical College Association's new Medical Centre on the east side of New York City, covering three blocks. Coolidge, Shepley, Bulfinch & Abbott, architects



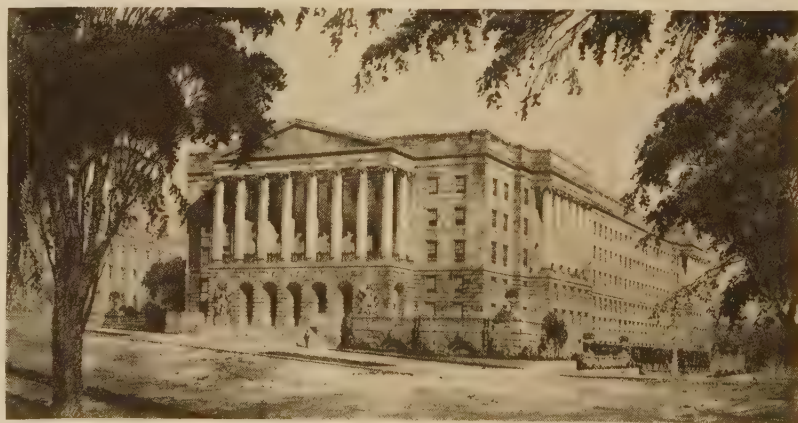
A high-school building recently completed at Ovid, Colo., composed entirely of brick in a single color. T. H. Buell & Company, architects

Architectural News



The Approaches (from automobile road) to the Tomb of the Unknown Soldier, Arlington National Cemetery. Lorimer Rich, architect

The new Art Gallery and Auditorium, American Academy of Arts and Letters, New York City. Cass Gilbert, architect, closely followed the façade of the facing building by McKim, Mead & White



New office building for the House of Representatives, Washington, D. C. David Lynn, Architect of the Capitol; The Allied Architects of Washington, consulting

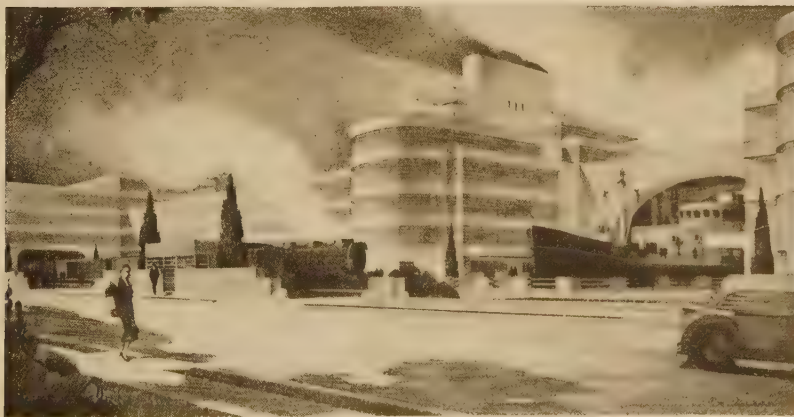


The Museum of the City of New York, facing Central Park from Fifth Avenue. Joseph H. Freedlander, architect

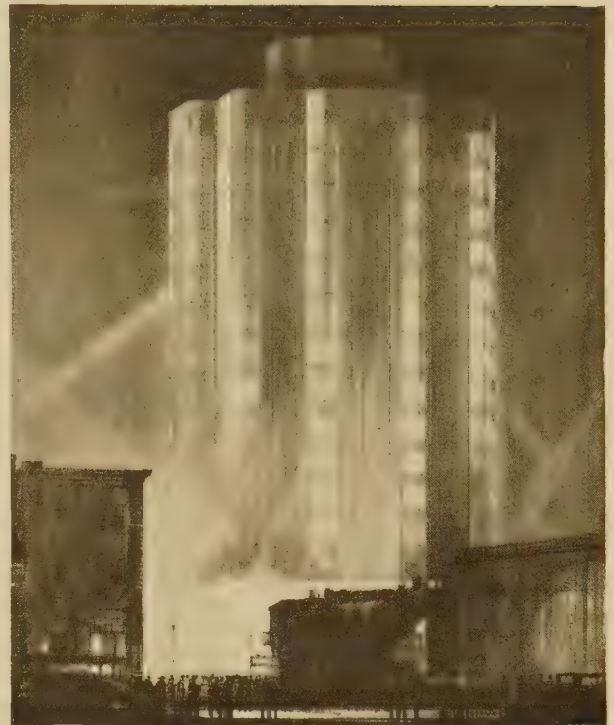
in Photographs



The Approaches (closer view) to the Tomb of the Unknown Soldier, Arlington National Cemetery. Lorimer Rich, architect



The proposed industrial section of the Hackensack Meadows development—railroads, ships, and highways converging—under the Regional Plan of New York



The proposed Edmond Meany Hotel, to be erected in Seattle, Wash. Robert C. Reamer, architect

The Marine Memorial at Kiel, the first and most important section of which has now been completed. G. A. Munzer, of Dusseldorf, architect. The complete scheme calls for a large ceremonial space to accommodate ten thousand people



Adaptability of Certain Ancient Methods to Modern Use

THE object of the present series of articles is to show what benefits may be drawn by us moderns from methods used by the ancients

during hundreds or perhaps thousands of years as revealed by measurements of the remains of Greek temples and other works.

They are of two kinds, artistic and economic, or of beauty and convenience. Even if there were no benefits to be had, the revelation would be of great interest and value for the light it sheds on the history of art, but that side of the matter does not come within the present purview. The measurements show with mathematical precision the systematic use of the simplest of all possible proportions and how they were obtained by the use of building units and modules.

It is this thought which has led me, putting aside all other interests and considerations, to devote my whole time and energies during the past six years to this work—a course I shall pursue to the end. To learn the principle which governed when art reached its culmination is a task worthy of any effort and any sacrifice—if sacrifice it can be called to occupy oneself in a matter fraught with such unbounded satisfaction and import.

It is needless to dwell on this aspect of the case, for the mere statement of it is sufficient. The object now, as stated, is to explain how the system can be applied to modern architecture, and the economic benefits to be derived from it. To explain in detail how it was used by the ancients can only be done by numerous examples, a process far beyond the bounds of the present undertaking but which it is hoped to accomplish in my forthcoming book, entitled "The Recovery of Art." In the first three articles of this series examples were given from certain temples which, although necessarily restricted in number, should be sufficient to satisfy any reasonable person of the truth. They represent but the merest fraction of the evidence in hand, which will be presented in due time. Suffice it now to say that similar conditions are found in all other parts of the structures mentioned and in all other buildings of their class which I have had an opportunity to study.*

* Further elucidations of the use of these proportions in ancient structures may be found in a smaller work already published, entitled "The Parthenon Naos." Price, \$10. Address A. Ohman, 111 East 40th Street, New York City.

By Ernest Flagg

Along with high artistic interests is an economic side of the matter, which lies chiefly in commensurability and the convenience and profit to be had therefrom.

It is this side of the subject which will receive most attention in the present work.

Following the method heretofore used—viz: to illustrate by very humble examples—it is proposed now to explain in detail the methods applied to the design and construction of the little house here illustrated. Although small, the building is purposely somewhat varied in outline and mass, the better to make a more complete demonstration, for methods which will apply to such a structure will certainly apply with greater ease to a simpler one.

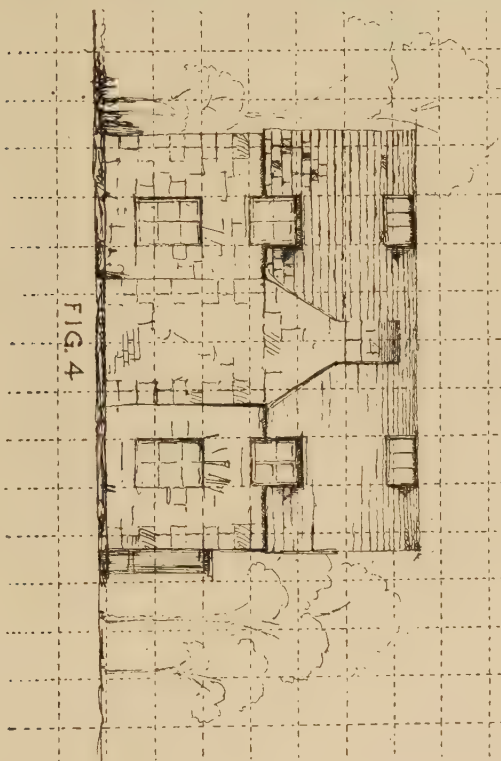
The first, even among economic considerations, is proportion, for the commercial value of beauty is great. Then the method used in making the plans will be considered, and finally standardized details, *i. e.*, all the various parts which go to make up the structure.

Now as to the proportions, one may not be able to design a masterpiece of any kind, but the chances for so doing will certainly be better if harmonious dimensions are systematically used than if discords are employed, and if proportions are obtained by guesswork the chances are all in favor of discord.

The accompanying illustrations represent the preliminary study from which working drawings are made. The paper is ruled in squares, each representing a building unit of 45 inches, which, as explained in a previous number, is one which I have found very convenient to use for such houses. This building unit is divided into three parts of 15 inches, and the part also serves as the module of proportion, for, as it equals the wall thickness, it fits evenly into all horizontal dimensions, and vertical dimensions can easily be so adjusted that it will fit evenly into them also. These preliminary drawings are made freehand, and it is only necessary to bear in mind that each square equals three parts and that the part is used as a module. For the working drawings the paper is ruled to represent both units and parts, as shown in Fig. 1, which illustrates the rulings at full size of a small part of one of the sheets. It is at an eighth-inch scale, *i. e.*, each of the larger squares represents 3 feet 9 inches at an eighth inch, but a quarter inch or any other con-

venient scale may be used instead if desired. The sheets which I use are 38 units wide and 49 long. A single sheet, measuring 24 inches by 19 inches, usually answers for working drawings—plans, elevations, and sections—of an ordinary house costing from ten to fifteen thousand dollars. The ruling is done with ink which, though faint, has a little yellow in it which brings out the lines clearly on blue prints.* As no figuring is necessary, drawings may be at a smaller scale than otherwise.

But to return to proportions, it will be seen from the drawings (Figs. 2, 3, 4, and 5) that they are as follows:



Outside (Fig. 3)

Whole mass, 16 modules high by 32 long, proportion as 1 to 2.

Main part below roof, 10 modules high by 14 long, proportion as 5 to 7.

Garage front and entrance, 8 modules high by 14 long, proportion as 4 to 7.

* It is very convenient to have properly ruled paper and cloth on which to make drawings of the kind described. I hope that in time it will be carried in stock by dealers, but in the meantime sheets may be had at cost from A. Ohman, 111 East 40th Street, New York City.

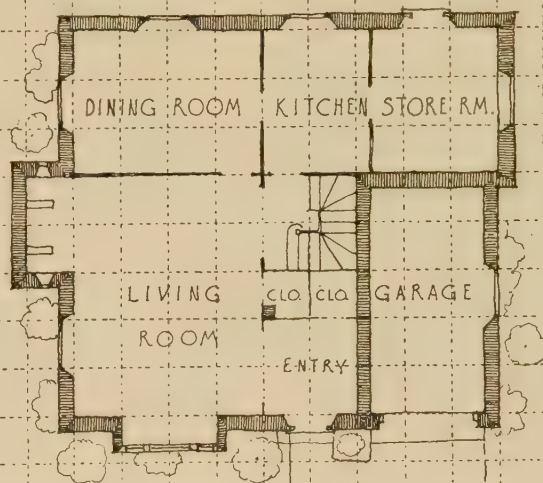
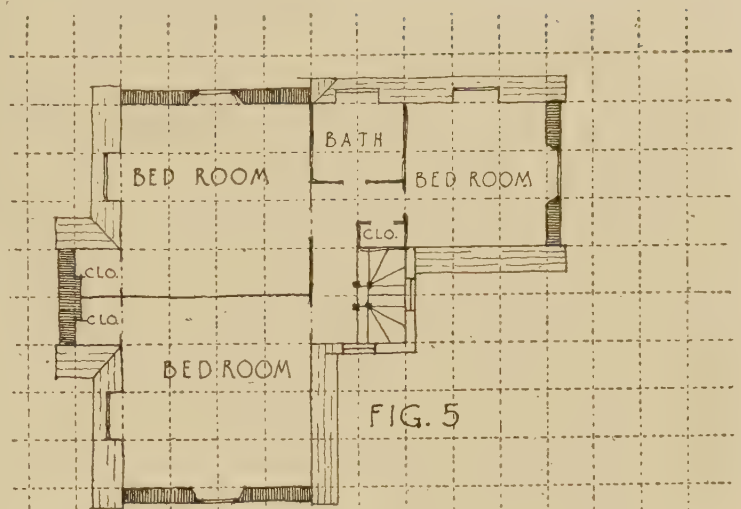


FIG. 2



FIG. 3

Preliminary studies for a house, made on paper ruled in squares, each side representing the unit of 45 inches

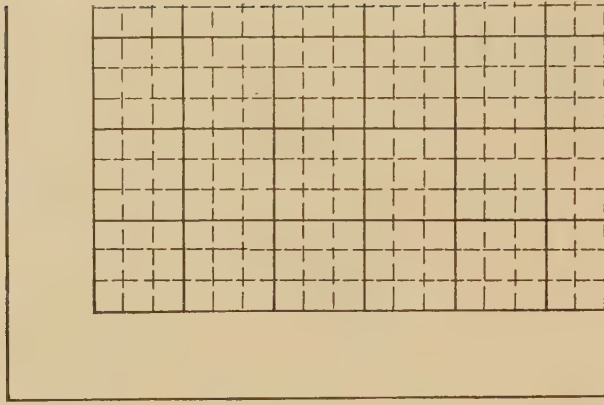


FIG. 1. Corner of ruled sheet for working drawings; each large square represents 3 feet 9 inches at eighth scale

(Fig. 4)

Whole mass, $19\frac{1}{2}$ modules high by 26 long, proportion as 3 to 4.

Central feature below roof, 8 modules wide by 10 high, proportion as 4 to 5.

Inside (Fig. 2)

Living-room, 12 modules wide by 15 long, proportion as 4 to 5.

Living-room, 6 modules high by 12 wide, proportion as 1 to 2.

Living-room, 6 modules high by 15 long, proportion as 2 to 5.

Dining-room, 9 modules wide by 12 long, proportion as 3 to 4.

Dining-room, 6 modules high by 9 wide, proportion as 2 to 3.

Dining-room, 6 modules high by 12 long, proportion as 1 to 2.

Windows, Doors, etc.

Lower windows, 3 modules wide by 5 high, proportion as 3 to 5.

Upper windows, 3 modules wide by 4 high, proportion as 3 to 4.

Bay window projection, 8 modules wide by 8 high, proportion as 1 to 1.

Garage doors, 6 modules high by 7 wide, proportion as 6 to 7.

Outside doors, 3 modules wide by 6 high, proportion as 1 to 2.

[Such simple proportions the eye grasps sub-consciously, just as the ear grasps harmonious

sounds. The hearer of melodious sounds may know nothing of the means employed to produce them, yet be captivated by the music, so too the observer of harmonious dimensions may know nothing of the means used to produce them yet be charmed by the harmony, the truth of which has been demonstrated through the ages by the universal admiration of Greek art, in which the temples prove that this principle governed. It will be seen that all of the above-mentioned proportions are in what we have called primary relationship of the first degree, that is to say, ratios expressed by a single digit on each side. To impress the mind, proportions must be simple, for it goes without saying the simpler they are the easier for the mind to grasp and the more impressive the result. It has already been shown that the ends of the Parthenon had the proportion of 1 to 2, executed with such exactness that discrepancy in the measurements from this proportion is only sixty-six thousandths of an inch.

Thus it appears that the more monumental the feature the greater the desire of the Greek artist to simplify proportions. It is not, however, always practical to use proportions of the first degree, and those of the second degree were also used by the Greeks, but sparingly. These are they which are expressed by a single digit on one side and two on the other, as for instance 3 to 11, 8 to 13, etc. It is manifest, however, that such ratios are of comparatively little value, for they are too complicated for the eye to grasp easily. If the ratio goes beyond the second degree, as 13 to 15 or 19 to 23, it is of course utterly useless, being entirely beyond comprehension.

There are surprisingly few ratios of the first degree, and of those few several are of little value. While there are 81 ratios between 1 to 1 and 1 to 9, most of them are duplicates. When these are thrown out only the following remain:

1 to 1	1 to 6	2 to 3	3 to 5	4 to 9	6 to 7
1 to 2	1 to 7	2 to 5	3 to 7	5 to 6	7 to 8
1 to 3	1 to 8	2 to 7	3 to 8	5 to 7	7 to 9
1 to 4	1 to 9	2 to 9	4 to 5	5 to 8	8 to 9
1 to 5		3 to 4	4 to 7	5 to 9	

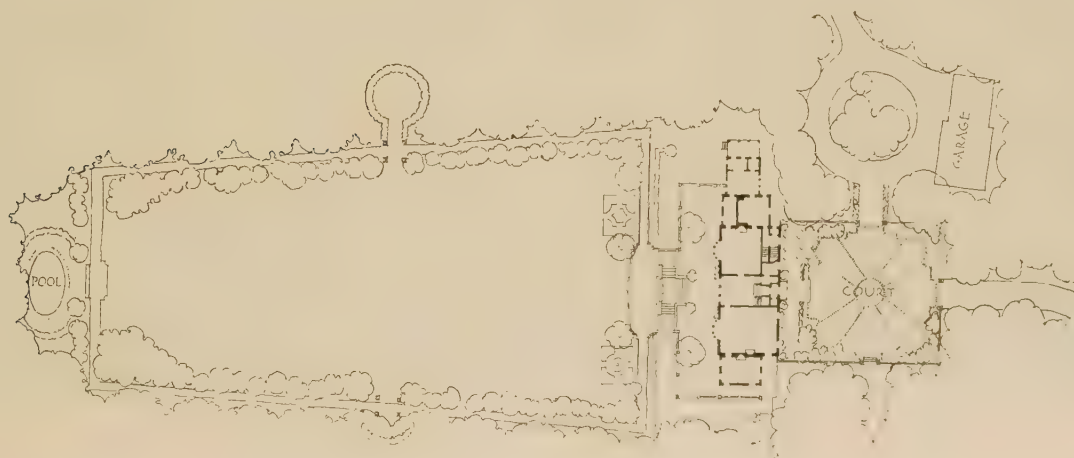
As these were the chief notes in Greek design, they are worthy of the most profound study. When they are applied the object has a quality of beauty not otherwise attainable, for by their use it becomes endowed with an intellectual quality which only the mind of man can give.



Photographs by Samuel H. Gottscho

HOUSE OF NORMAN DE R. WHITEHOUSE
BROOKVILLE, LONG ISLAND

BOTTOMLEY, WAGNER & WHITE, ARCHITECTS

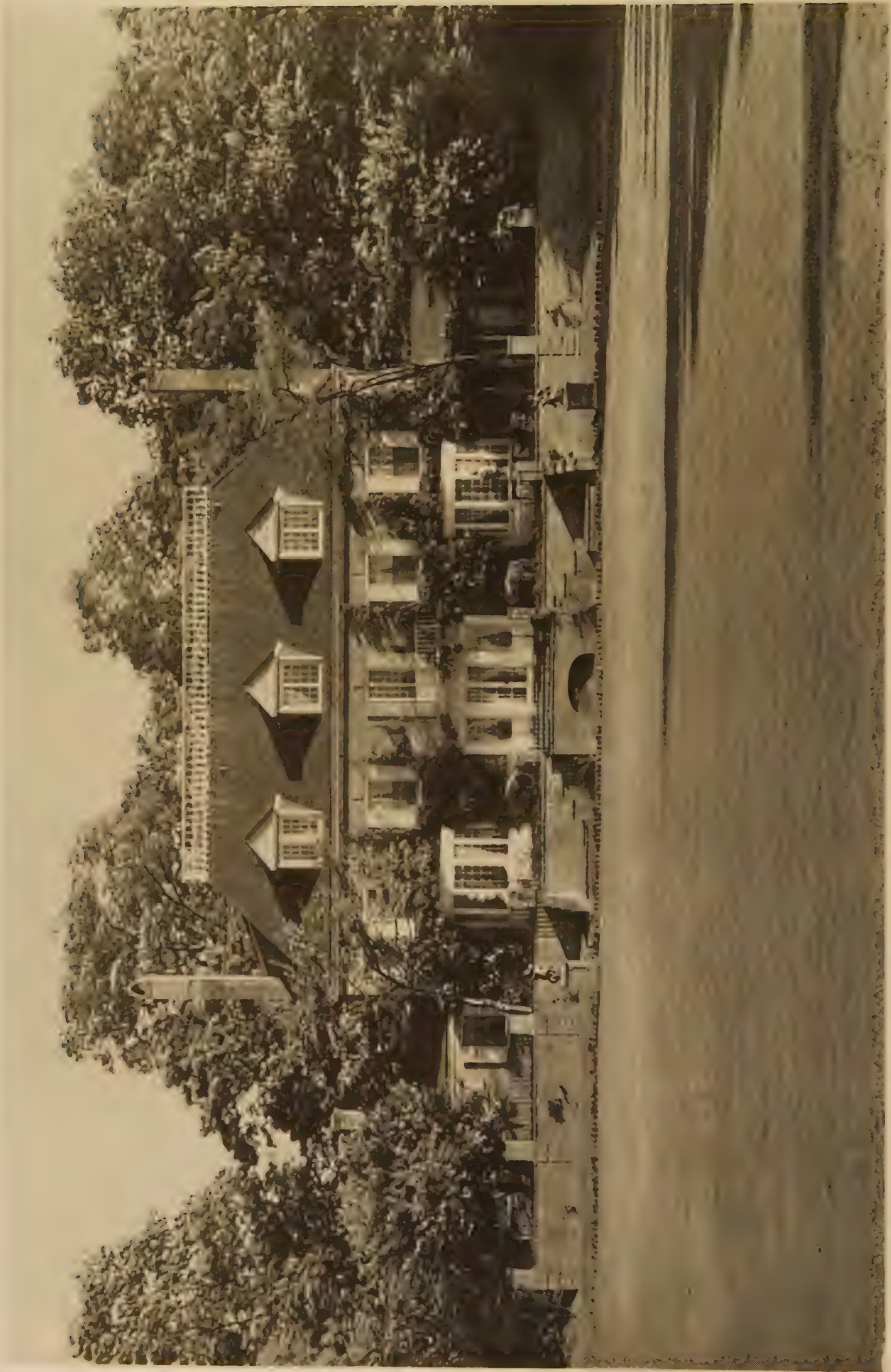




HOUSE OF NORMAN DE R. WHITEHOUSE, BROOKVILLE, LONG ISLAND
BOTTOMLEY, WAGNER & WHITE, ARCHITECTS



HOUSE OF NORMAN DE R. WHITEHOUSE, BROOKVILLE, LONG ISLAND
BOTTOMLEY, WAGNER & WHITE, ARCHITECTS



The garden front

HOUSE OF NORMAN DE R. WHITEHOUSE, BROOKVILLE, LONG ISLAND. BOTTOMLEY, WAGNER & WHITE, ARCHITECTS



End of the library

The dining-room



HOUSE OF NORMAN DE R. WHITEHOUSE, BROOKVILLE, LONG ISLAND
BOTTOMLEY, WAGNER & WHITE, ARCHITECTS



From library to hall

HOUSE OF NORMAN DE R. WHITEHOUSE, BROOKVILLE, LONG ISLAND. BOTTOMLEY, WAGNER & WHITE, ARCHITECTS



Dining-room fireplace

NUMBER XI
IN A SERIES
OF
WORKING DRAWINGS

By Jack G. Stewart

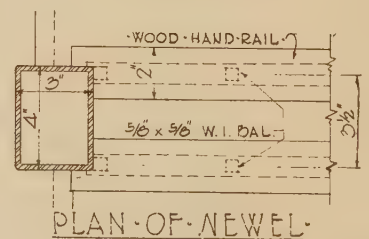
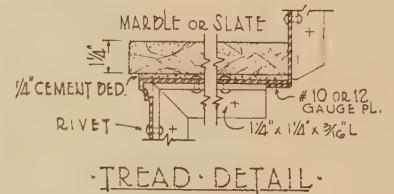
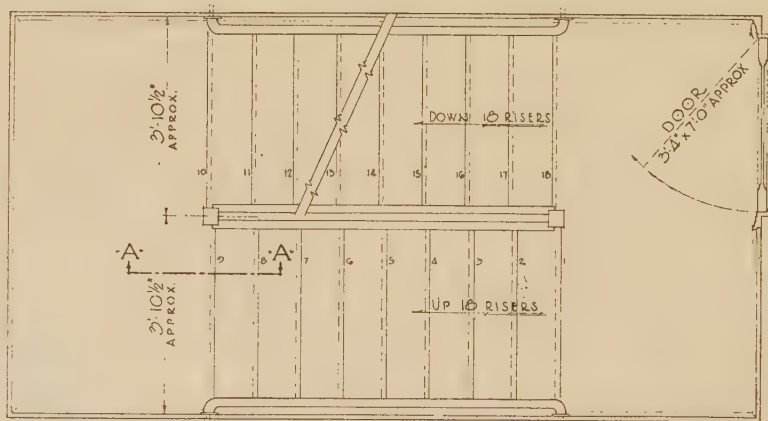
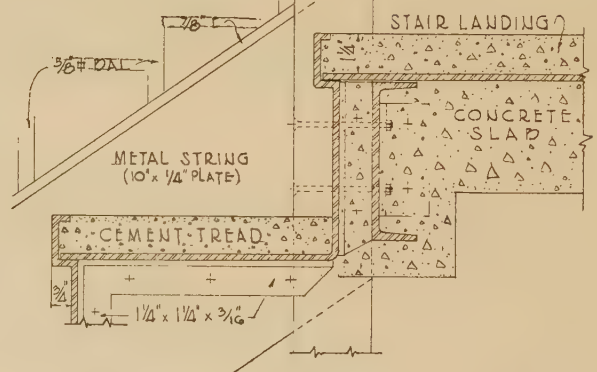
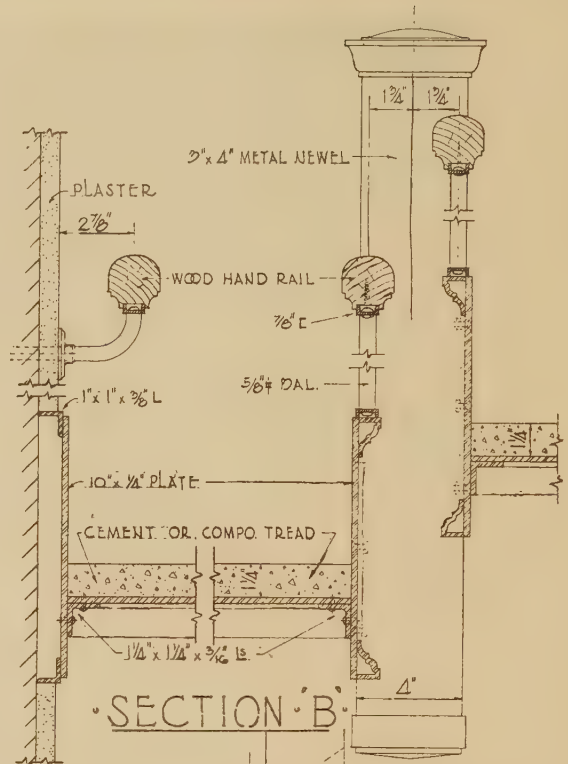
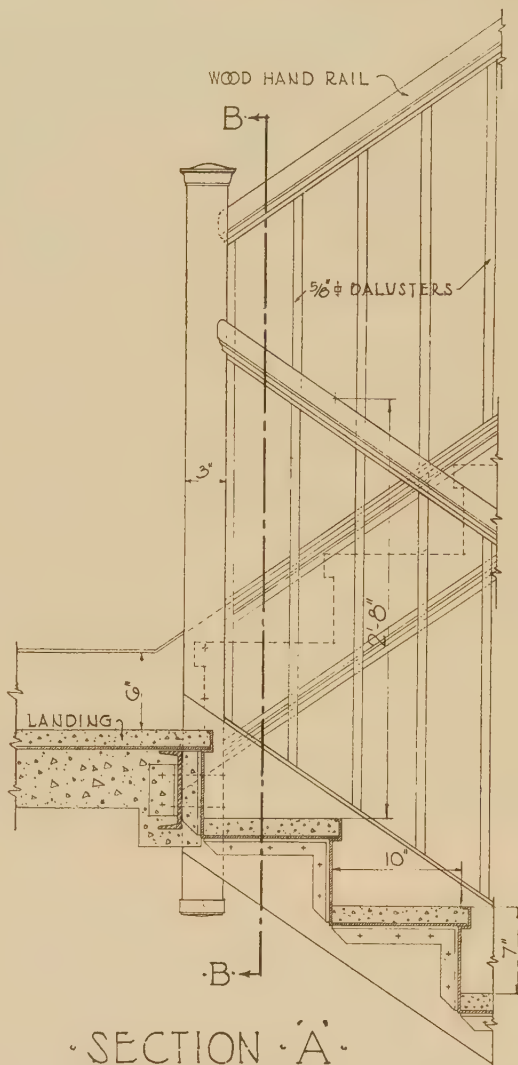
This series, in which one drawing will appear each month, is designed to cover the smaller practical problems that confront the architect in his day's work. The subjects chosen are those which, while not uncommon, call for some experience and knowledge of approved solutions. Next month the subject is Elevator Construction.



[ARCHITECTURE]
CHARLES SCRIBNER'S SONS

PREVIOUS SUBJECTS IN THIS SERIES

- I. FLAGPOLE HOLDER ON AN EXTERIOR WALL
- II. RADIATOR ENCLOSURES
- III. CIGAR SALES COUNTER
- IV. WOODWORK IN A LIBRARY
- V. BUILT-IN KITCHEN CUPBOARD
- VI. VARIOUS TRIMS AND MOULDINGS
- VII. TELEPHONE BOOTH
- VIII. MEN'S TOILET
- IX. WINDOW SPANDRELS
- X. CIRCULAR STAIR FOR A RESIDENCE



DETAIL OF METAL STAIR CONSTRUCTION


SCALE 0 5' 0" 10' 0" 15' 0" 20' 0"

PLATE NO. 11

Some Pitfalls in Supervision

By W. F. Bartels

IX. PLASTERING

T is generally presupposed by the superintendent that the plastering will automatically be well done, and that his criticism of the final white coat will be sufficient. As a matter of fact, the final result is the sum total of all work and materials from the first coat to the last. Also it must be remembered that over 70 per cent of the cost of plastering is paid for labor, so that it can readily be appreciated how much time and effort must be spent on supervision in order to obtain the quality of first-class workmanship.

Furring, which may be one of several types, is desirable in order to secure the successful interior plastering of exterior walls. It provides an air space which prevents the transmission of heat, cold or dampness. Successful insulation against cold during a severe winter saves sufficient in fuel to repay the cost of furring. Furthermore it prevents the walls from "sweating," a source of annoyance to the tenant and the maintenance man. To the former it means a damp, chilly wall, to the latter a constantly recurring bill for redecorating.

Wood furring is generally applied by merely nailing vertical strips directly to the masonry wall (in non-fireproof houses). It is obviously shortsighted to put the responsibility for a perfect plastering job on a few nails hammered into an occasional joint; a preferable method is to use a plug, expansion screw, or some other approved method of fastening. It is good practice to have one furring strip at the top, running horizontally, in order to prevent too much air circulation.

When clay tile or gypsum blocks are used as furring, they should be well anchored by clips which have been built into the outer wall. In this matter of clips the superintendent must keep a vigilant eye to see that these clips or anchors come very near the joints in the furring. Unless they do, in all probability they will not be used. When a wall is to be flush between piers or columns the lath or mesh should not be abutted at the pier or column but should be carried across the face.

In furring with metal lath or wire mesh, the supports should be examined to ascertain whether they are adequate and the mesh properly fastened to them.

Damp-proofing is not furring and is not com-

parable to it. However, its cost, due to ease of application and saving of labor, material, etc., makes its use quite common.

Damp-proofing is applied by trowel or brush, or otherwise is sprayed on with a hose and nozzle under pressure. The latter two produce a shiny, smooth surface. A dull, sticky surface may be obtained with a trowelled coat, but its composition differs from one which may be brushed or sprayed. Certain trowelled emulsions must be avoided, because they are very likely to peel from the brickwork, with disastrous results for the plaster. Some plasterers maintain that they can plaster on any damp-proofing, while others insist on trowelled surfaces having finely imbedded gravel, in order to provide a bond for the plaster. However, a written guaranty from the damp-proofing and plastering contractors, to the effect that the plaster will not fall off due to the damp-proofing, is to be recommended.

Since grounds should finish flush with the plaster, their thickness will govern the combined thickness of the several coats. They should be securely fastened, since bases, picture moulds, and panelling, when used, are fastened to them.

Great care should be used in the installation of corner beads, for the plasterer must of necessity follow them, plumb or not plumb, and slanting or wavy corners may result—plus annoyance at a poor job.

Wood lath should be well nailed and the vertical joints broken every seventh lath. The ceiling lath should run in one direction. No lath, either on wall or ceiling, should have supports more than 16 inches apart. The distance between abutting laths at their ends should be $\frac{1}{4}$ -inch, and the space between parallel laths should be about $\frac{5}{16}$ -inch. This enables the plaster to form a key in back of the lath.

Where wood lath meets brickwork it should be joined by a piece of wire lath, or cracking will result later. Similar care should be taken with upper corners where there are to be coves for which the lathing is not properly blocked out. Where plumbing pipes are run in the partitions of kitchens and baths, it will generally be found that the gypsum or tile will be badly cut up, if it does not disappear entirely. In all probability the pipes run flush with the face of the partition, with their hubs or sleeves sometimes projecting.

The most satisfactory job is obtained when wire mesh covers the entire area of pipes and hubs to avoid subsequent cracking.

Wire lath and mesh should be pulled taut and securely fastened. Where either is used for hung ceilings it must be wired at intervals sufficient to hold it close to the small angles and channels. These in turn are held by supports, in the "arches" or floor construction, which are about four feet apart lengthwise. In the case of hung ceilings it is well to make certain that all soil and water pipes running above the hung ceiling are insulated, to obviate danger of condensation dripping down on the plaster.

Plasters in general are made of either lime or gypsum. These materials in turn are made by heating limestone (mostly calcium carbonate) and gypsum (largely calcium sulphate) to a high temperature. The finished product arrives at the job in paper bags, and is labelled according to its content. Since the manufacturer is anxious to have his material used, he can always be depended upon to explain the constituents of his product, the proper method of using it, and under what conditions it can be best used. This of course is not altruism on his part but merely good business, since having it used successfully will increase the sale.

The inert ingredient of plaster, namely sand, should be clean and free of loam. It should not contain salt, because this would likely unite with chemicals in the plaster and cause trouble later. Likewise the water used should not be brackish but clean and pure—good enough to drink.

The first plaster applied to walls is generally termed the scratch coat; the next, the brown coat; and last, the white or finish coat. What is called the bond coat is a special plaster used generally on the bottom of concrete arches to form, as its name indicates, a bond for the subsequent coats. It should be allowed to set but not to be fully dry before the next coat is applied. The brown coat is generally applied directly to the bond coat, except on the beam soffits, where it is customary to follow the bond coat with the white coat.

The scratch coat is the first coat where wire lath, wood lath or mesh is used. Its job is to hook fingerlike parts around the lath to form a firm base for the next or brown coat. It is this hooking around or keying which supports the plaster. Hence if the spaces between the lath are too small it cannot get in. If they are too large the plaster will be unable to hold its own weight and will drop off. If the plaster is too dry

it is difficult to force it in far enough to form a good bond. With wood lath it should form a good key. In wire mesh it should be so pressed in as practically to cover the mesh in the rear. To enable the scratch coat to do all this and cling tenaciously, there is mixed with it a fibre of some kind. After the scratch coat is applied it should be roughened up or scratched on the surface to form a key or bond for the brown coat which follows.

The brown coat, which is next applied, has a good proportion of sand, but care should be taken to see that it is not all sand. It should be trued up with a straight edge and then floated smooth, ready to receive the white coat. Where there are brick, tile or gypsum-block walls the brown coat may be applied directly to them. Of course, the brick walls must be straight and true and free of large projecting lumps of cement, and the tile blocks used must be properly scored or keyed, otherwise the brown plaster will not cling to the smooth tile. At times "doubled up" work may be permitted. This consists of putting on the scratch coat and then applying the brown coat on top of it immediately. Of course, this method saves taking down and putting up scaffolds, but great caution should be exercised in allowing this on wood lath. On mesh it should not be permitted at all, because the scratch coat is not stiff enough to hold the brown coat until it is dry and the mesh cannot carry it properly.

The white coat is at once the most difficult to apply and the most trying to superintend, as well as the most rarely well done. It is generally made of lime putty as the principal ingredient, made from quicklime (lump-lime) by slacking it in water and letting it stand until the mass is entirely cool. Great heat is generated on adding water to the lime, hence enough water must be added and the mixture well stirred or some of the lime will "burn." Hydrated lime is probably more frequently used now in the cities because it takes far less time to slack. Hydrated lime is only quicklime to which sufficient water has been added to combine with it chemically. It has the advantage of being usable in twenty-four hours, while the lump-lime sometimes has to stand a week or more. In no case should lime putty be used while it is still warm. When the putty is ready to be used it is put on the plasterer's board where it is mixed by the plasterer with plaster of Paris (calcined gypsum).

In the next instalment Mr. Bartels concludes the subject of Plastering and takes up Flooring.

Monday, February 2.—Alfred M. Granger has temporarily taken up his abode in Vienna, and writes to his Chicago friends:

"We have been in Vienna just one week, but begin to feel quite at home. Our crossing on the *Statendam* was smooth and delightful. I got off at Plymouth; spent nine days in England visiting Liverpool to see Sir Giles Gilbert Scott's great cathedral, which, when finished, will be much the largest church of England's cathedrals in Great Britain.

"Its situation is superb and the plan original and most interesting, but I was disappointed in the ornament, because to me it seemed greatly out of scale.

"... There is an imperial grandeur about London that no other city possesses and its modernization is so much more dignified and harmonious than what is being done in Paris. With its many trees, squares and gardens it always impresses me as a friendly home-loving city. Not violent like New York.

"Was only in Paris one week, and it poured rain all the time. Paris is being Americanized in the worst American manner, and to-day the Champs Elysees looks at night like Broadway and is given over to automobile salesrooms. On the left bank of the river Paris still is French and beautiful.

"Le Corbusier was not in town when I called, but I met his partner, Jeanneret, saw some of his houses and his scheme for tearing down vast sections of the city, wiping out all the old landmarks and rebuilding in the modern manner. One can only hope and pray it may never be done. There is a great idea back of what these men are doing, but these developments should be carried out on the outskirts of the city, as is done in Vienna, and not wipe out the past. None of the modern work of Paris can in any way compare with what is being done in Chicago."

Thursday, February 5.—"Shall we live in horizontal or vertical cities?" was the title of a debate to-night at The Architectural League—a joint meeting of the New York Chapter, A. I. A., and The League itself. Henry Wright and Frederick L. Ackerman were announced as speaking for the horizontalists, Ralph T. Walker and Raymond Hood for the verticalists, but it was very difficult for the hearers to know which particular side any speaker was arguing upon. As Richmond Shreve remarked near the end of the evening, it all sounded very much like a Wickersham Report.

The trouble was that Ralph Walker, though arguing for the vertical city, lives in a one-story country house, and Henry Wright, stressing the need for horizontalities, lives in an apartment. The kernel of the evening's discussion was expressed by Lee Simonson when he pointed out that the basis of the whole matter was proper ownership or control of land so that widespread plans could



The Editor's Diary

be made and carried out without the jeopardy of land speculation.

Saturday, February 7.—The "bricks" thrown at federal and municipal architectural bureaus seem to be coming more thickly these days. One of the most recent is contained in a survey made by the A. I. A. on the subject of school buildings, under the chairmanship of William J. Sayward. "There seems to be a very general practice of furnishing stock plans without further service to rural communities for the small type of school building of not more than two, three, or four rooms." This service is no doubt well justified. In the case of larger buildings, however, special architectural service becomes of value to the community. The "brick" itself, however, reads as follows:

"Probably the most illuminating example of departmental control of architecture is that of the Federal Government, under the Office of the Supervising Architect of the Treasury. While this department turns out a consistently uniform product, probably above the average from the standpoint of design and construction, it is notably true that it furnishes very little inspiration to the communities which have Federal buildings.

"Methods of design and practice, except in buildings of large size and character, have become so standardized as to be a dead level in architectural achievement, and incidentally there is little or no saving in cost of production. If this be true of the Federal Government, how much more must it be true of the 'architectural bureau' of the lesser community?"

Monday, February 9.—Met Charles Butler and Hobart Upjohn at lunch for a meeting on the Institute's activities in architectural education. A change in college entrance requirements opens up a new field of opportunity for instilling into the high-school and preparatory-school students some fundamentals of art appreciation. Instead of requiring a hard-and-fast list of subjects for entrance examination, the colleges are shortening the list of required subjects with permission to the applicant to ask

for examination on any other subject in which he may have been interested enough to prepare himself—textile design, art appreciation, handicrafts, or whatnot. The opportunity for architectural education, therefore, is widened so that for the first time the curricula of these secondary schools can be made to include regular or incidental instruction or lectures on such things as an appreciation of architecture. Incidentally, the time seems ripe for such instruction in that the public's interest in architecture seems rarely to have been keener.

Tuesday, February 10.—Albert Kahn, whose office in Detroit is one of the largest in the country, says that he finds it of great value to have a considerable number of his men interested in the firm financially. This interest is in several forms. First, the firm carries, for a considerable number, life insurance for the benefit of their families on the ten-year-endowment plan. If a man leaves within the first five years, the paid-up value reverts to the firm. After five years, the policy is his. Second, the firm is incorporated, and about twenty-five of the men were permitted to buy preferred stock in proportion to their salaries. The stock is guaranteed to pay 15 per cent, though up to this year it has regularly paid 20 per cent. The stock is purchased by borrowing 50 per cent of the cost from the banks with the firm's endorsement. The other 50 per cent the firm carries without interest until the bank's indebtedness has been liquidated. Thereafter, the man pays the firm. The stock is redeemable at par upon a man's leaving, but in case of death, dividends are continued for two years. Preferred stock bonuses are distributed occasionally as a reward of special merit, with the understanding that the stock reverts to the firm in case the employee leaves within five years. Mr. Kahn says that the result of all this has been that their important men have stayed with the firm, many for ten, fifteen, and twenty years; two or three, even twenty-five years.

Wednesday, February 11.—America is rapidly becoming color conscious according to Professor Lukiesch, who spoke under the auspices of some of the engineering societies to-night. Incidentally, the auditorium holds eight hundred fifty. It was foreseen that there might be more applications than this for the lecture, so he had kindly agreed to repeat it on two nights. The fact is, however, that there were seven thousand applications for tickets. Professor Lukiesch bases his theory of a growing interest in color upon the fact that we receive 83 per cent of our impressions from the outside through our eyes. Eleven per cent more comes through our ears, and the rest through the other senses. The psychological effects of color are only begin-

ning to be understood, and even now are capable of dispelling much of the monotony of life.

Friday, February 13.—At The League to-night Dr. Francis S. Onderdonk, of the University of Michigan, passed on to his audience some of his enormous enthusiasm for ferro-concrete and its effect on architectural style. He laid great stress on the fact that ferro-concrete is a liquid stone which should logically take flowing, curved form rather than the box-like masses so frequently resulting from our dependence upon wood centring.

Monday, February 16.—It is amusing to stand off, in one's mind, at about the year 4000 A. D., and look back over the history of lighting. From the dawn of civilization up to 1783, mankind depended for his artificial light upon fats, oils, and resinous woods. In that year oil-burning wick and chimney were invented by a Swiss mathematician. Then in 1820 Dr. Kugler invented gas. Sixty years later came the electric light, which we have now had for fifty years. Is it not curious to realize that the design of our lighting fixtures is still largely imitative of oil lamps and gas burners? Looking back from 4000 A. D., the effect of gas pipe upon design in the art of illumination must inevitably appear very short-lived.

Thursday, February 19.—David Coyle and I went to the dinner and evening meeting of the Illuminating Engineering Society, where Kenneth Murchison, Philip Cusachs, William F. Lamb, and Harvey Wiley Corbett spoke on many things. Mr. Lamb brought out the absurdity of our piling so much weight upon our steel-frame buildings—not being able apparently to rid ourselves of the masonry structure idea. Just as we perceive this clearly, and are beginning to strive to make our tall steel-frame buildings express their thin shells, David Coyle points out the fact that quite possibly it is the weight itself in these high slender structures that makes them endurable for the tenants. The sway of a tall slender steel-frame building would not be greater in extent if the structure were lighter, but the acceleration of this sway would be much greater. The question is, how much movement will we accept in our high offices? The very slow movement of the heavily weighted frame seems not to bother us. The quick, whiplash movement of a thin, light structure may be unendurable. So, just as we are beginning to think that we are all wrong in building heavily weighted steel-frame structures, we come to the astonishing fact that perhaps this is the only possible solution, for physiological reasons.

We shall know a lot more about this within a year or two, for Coyle is about

to make some experiments in the effect of various such movements on human consciousness.

Monday, February 23.—There are signs that this country is beginning to be architecture-conscious. To-day in Philadelphia there was awarded the annual Bok Prize of ten thousand dollars to that person who, "living in Philadelphia, its suburbs, or vicinity, shall have performed or brought to its culmination during the preceding calendar year an act, or contributed a service, calculated to advance the best and largest interests of the community of which Philadelphia is the centre"—Paul Phillipe Cret, architect.

Tuesday, February 24.—The A. I. A. has come out once more with unmistakable emphasis against the issuance by an architect of a monograph supported by the advertisements of contractors and material dealers. A very able discussion of the principle, or lack of principle, involved in this practice, prepared by the Chairman of the Committee on Practice, appears in the December *Octagon*.

Thursday, February 26.—It is a good sign of our growing concern as a people, with architecture, that possibly three hundred persons met to-night at The Town Hall Club to enjoy a protest against architecture that has yet not come into being. Lee Simonson introduced Alexander Woolcott, who presided, and he in turn introduced Lewis Mumford. The burden of the latter's argument was that, since Frank Lloyd Wright is known not only in this country but internationally for his creative genius, the country had a right to expect that he have something to do with the coming World's Fair. Those who are controlling the destinies of the Fair, however, have believed that Wright is so much an individualist as to be unable to form part of a team in the design of a work which, to their minds, necessitates close teamwork. Mr. Wright himself was introduced by Mumford, and, as usual, spoke most interestingly upon what the Fair might have been if, as he claims, its design were not squeezed into the strait-jacket of what is nothing more than a continuation of eclecticism. In place of choosing among the historical styles of the past, which architects have been doing for many generations, he feels that they are now merely choosing the latest manifestation of style—the Modern, and are following the patterns and incidental motives of this style without knowing anything of its fundamental basis. "You cannot take classic motives, wash them behind the ears, and make modernism of them." After an evening of direct attack upon the design of the Fair, in which Douglas Haskell also joined, it was suggested that Raymond Hood, one of the Fair's architectural

commission, might say a word in rebuttal. He contented himself with making two rather telling rejoinders; first that, since freedom of thought and action seems to be one of the main desiderata of those who seek a new and better architecture, it might reasonably be supposed that such freedom would be granted to those in whose hands the task had been placed. Second, if this whole question were going to be debated, he could have wished that the shock troops brought up in Mr. Wright's behalf might have included some individuals outside of the literary world, whose knowledge of architecture by direct contact could have been more in evidence. The encouraging thing, however, is that, in the utmost good humor, those whose opinions are apparently so radically opposed, could come together without bitterness, and with the sole thought of securing better architecture in coming generations. Incidentally, we are moving apace when Raymond Hood can be accused to-day in a public meeting of the crime of eclectic design.

Friday, February 27.—Seven or eight hundred people crowded the new auditorium of Joseph Urban's New School for Social Research to-night to hear Frank Lloyd Wright on modern architecture. He put his audience to the hardest possible test—reading from his manuscript for an hour and a half. When it was over a crowd of his hearers, hungry for more, gathered around him on the stage to ask questions and to learn more of his philosophy of life and his conception of architecture. A masterly summation of what architecture has been, is, and what it might be if we measure up to our opportunities. Wright symbolized the grasp of this art by the human hand, the thumb representing the fundamental conception of architecture as enclosed space rather than a hole in a cliff or something behind a pictorial façade. The four fingers represent four accessories which should help us to achieve the possibilities that lie before us: glass, which obviously would have turned upside down the architecture of any previous age, as it will that of our own; steel, the material giving us strength in tension as well as in compression, making possible forms no longer bound by the piling of stone upon stone, or beam upon post; the third finger representing that which the characteristics of our multitudinous materials give us, and which to achieve architecture must control form and feeling—structures of wood must be woody; of stone, articulated masonry. Finally, the fourth finger, integral ornament, giving us something more than bald functional construction, something more than the flat planes and hard lines of the machine, something that satisfies a higher desire than that for shelter and convenience, the need for beauty.



CONTACTS

DEVOTED TO A BETTER UNDERSTANDING OF THE BUSINESS SIDE
OF ARCHITECTURE AND ITS RELATION TO THE INDUSTRIES



What Price Alternate Bids?

By Harry H. Bond, Jr.

Sanitary Engineer for Starrett & Van Vleck, Architects, New York

THE financing, planning, construction, and operation of the modern building costing in excess of \$3,000,000 is an undertaking of enormous responsibilities. While the management of the skyscraper is in itself a business of considerable proportions, its construction and maintenance may be looked upon as the combined results of many businesses. The service offered by the large commercial building is a correlated organization of the service of many widely different products.

In the final analysis, the skyscraper owes allegiance to two groups. First, to that group of stockholders whose subscriptions have made its existence possible. Theirs is the investment and to them must be returned a fair realization on that investment. Second, to those concerns and individuals who inhabit its shops, offices, and halls, and who are entitled to a full measure of the service for which they are paying. Any breach of this contract, whether it is written or implied, is a destructive thrust aimed at the very foundations of the building industry.

The product of the skyscraper is service. Building service does not mean the discomfort of cold or overheated offices and halls, cluttered corridors due to repairs of inferior equipment, eye-strain and accidents due to poorly planned lighting, or lengthy, waterless intervals due to the initial use of short-lived piping materials.

The successful life, which is that period when office or shop space is in demand, of any large commercial building, may be measured in the life of the key materials of which it is constructed. This is not a new thought; it is an old fundamental

principle with which architects, consulting engineers, general contractors, sub-contractors, building committees, and the manufacturers of building materials are all familiar. Yet, in spite of the grave importance of material selection and application we find a most uneconomic practice in modern building becoming an every-day occurrence.

It is the purpose of this article to call attention to this practice in order to promote its correction and to make all of us who are interested in the building field more conscious of our responsibilities and the responsibilities of our associates.

Taking pipe as an example, because of its importance to any building, and because it has been made one of the most frequent sufferers, let us consider this departure from good engineering procedure.

Every architect, engineer, and contractor realizes the importance of a correct piping installation because of its location behind walls and in other inaccessible places where replacements and repairs are expensive. Why then, if every one who is engaged in the construction of large commercial buildings is familiar with correct and incorrect piping practices, should we hear that the specifications for an important building, written by one of our most brilliant architectural and engineering houses in New York City, were allowed to be changed to the extent that a fairly expensive piping material was installed in the non-corrosive vacuum sweeper lines and a much cheaper material in the corrosive lines?

The plumbing and construction bids were found to run higher than the estimates. A separate sub-con-

tract for the vacuum-sweeper system was found to run well within the estimates. The situation resulted in the building committee's accepting cheaper piping materials than those recommended for the plumbing system, and letting the vacuum-sweeper system stand as specified with unwarranted material expense. Here is a building which has wrought-iron pipe in its vacuum-sweeper lines where less expensive steel pipe is eminently proper, and steel pipe is used in some other lines where steel pipe should never be used. Is it a wonder, then, if such practices are common occurrences, that in a very short time many buildings show staggering pipe maintenance costs?

To illustrate what I mean by staggering costs, a building in the West a short time ago had a failure in an unimportant pipe line because of the original installation of improper piping materials. The total cost of the pipe in the line, even with the proper materials installed, would have been less than \$100, yet the cost of tearing out the failed line and making replacements was over \$1,500. Within a comparatively short time another line, exactly similar, in a different part of the building failed and the process of renewal had to be repeated, at a similar cost.

Specifications calling for alternate bids are probably the most damaging and far-reaching of the evils that have crept into the architects' and engineers' offices with such a marked hindrance to the proper selection and application of materials. In drawing up the specifications for some of our largest buildings, consulting engineers, as well as engineers in architects' offices, write plumbing, heat-

ing, and air-conditioning specifications calling for wrought-iron pipe and asking for alternate bids on steel pipe, or calling for brass pipe and asking for alternate bids on wrought-iron pipe. Sometimes this practice is adopted to provide the engineer with a loophole in which he can seek refuge in case the bids run higher than the estimates. In other instances, building committees have been known to insist that alternate bids be requested in specifications for the same reason. In either case, the engineer is shirking a plain engineering duty. His knowledge of piping materials and their application to the problem at hand, and of the false economy that is secured through the initial use of cheap materials, should be sufficient to convince every one concerned that his selection of piping materials will result in the greatest saving and should be followed minutely if satisfactory results are desired.

Perhaps another reason for the application of this practice to piping materials may be found in the pressure of daily business which prevents the engineer who writes the specification from gaining a sufficient knowledge of piping materials and their proper uses. Too much

importance cannot be attached to the need of such knowledge. The selection of the proper piping material is as much of an engineering job as the specification of the weight and thickness of beams.

The engineer who is not satisfied with a mediocre knowledge of pipe, but who familiarizes himself thoroughly with the requirements of the operating condition before writing any specifications, has learned that there is a specific application in every building for many kinds of pipe. He recognizes that brass, wrought iron, and steel pipe are the right materials only when they are used in the right places. This engineer has also learned that his experience with other piping materials under similar conditions and in the same vicinity is a reliable guide to proper selection. In cases where he is working under strange conditions he knows he is justified, because the stakes are high, in asking the help of a pipe manufacturer's service engineer in analyzing the surrounding conditions, including the water, and in applying this information to his selection of materials. He also takes into consideration the effect of any water-treating equipment that is to be included in the specifications.

Only after weighing the relative effect of all conditions can he make his selection of piping materials with the full knowledge that the best possible pipe will be used in each operation. The writing of specifications calling for alternate bids never enters his mind, because he is in a position to justify his choice of materials from an engineering view-point to the satisfaction of any building committee. And, finally, he is never confronted by an angry owner a few years after a skyscraper has been completed who cannot understand why such a good engineer allowed such a poor piping system to be installed in his building. Truly man's memory is short!

While this article has been concerned mainly with piping, it presents an example that is typical of the misdirection of sound engineering knowledge in the writing of some specification sheets. We have too many sick buildings. For the general good of the industry, it would be well if we took a little more care and thought in the writing of the prescription for their construction.

Let us remember that specification sheets should not be utilized merely as the battle-fronts of building owners and contractors versus costs.



In these days when our talk is of glass and steel as an embodiment of much that is modern, it is interesting to look back at Joseph Paxton's Crystal Palace, designed by a gardener, erected in Hyde Park, London, 1851, subsequently re-erected in Sydenham, and ridiculed almost uninterruptedly since.



ARCHITECTURE'S PORTFOLIO OF ALTARS



THE FIFTY-FOURTH IN A SERIES OF COLLECTIONS
OF PHOTOGRAPHS ILLUSTRATING VARIOUS MINOR
ARCHITECTURAL DETAILS

Forthcoming Portfolios will be devoted to the following subjects: Garage Doors (May), Mail-Chute Boxes (June), Weather-Vanes (July), Bank Entrances (August), Urns (September), and Window Grilles (October). Photographs showing interesting examples under any of these headings will be welcomed by the Editor, though it should be noted that these respective issues are made up a month in advance of publication dates.

❖ ❖ ❖ *Subjects of Previous Portfolios* ❖ ❖ ❖

1926-27

DORMER WINDOWS
SHUTTERS AND BLINDS
ENGLISH PANELLING
GEORGIAN STAIRWAYS
STONE MASONRY TEXTURES
ENGLISH CHIMNEYS
FANLIGHTS AND OVERDOORS
TEXTURES OF BRICKWORK
IRON RAILINGS
DOOR HARDWARE
PALLADIAN MOTIVES
GABLE ENDS
COLONIAL TOP-RAILINGS
CIRCULAR AND OVAL WINDOWS

1928

BUILT-IN BOOKCASES
CHIMNEY TOPS
DOOR HOODS
BAY WINDOWS
CUPOLAS
GARDEN GATES
STAIR ENDS
BALCONIES
GARDEN WALLS
ARCADES
PLASTER CEILINGS
CORNICES OF WOOD

1929

DOORWAY LIGHTING
ENGLISH FIREPLACES
GATE-POST TOPS
GARDEN STEPS
RAIN LEADER HEADS
GARDEN POOLS
QUOINS
INTERIOR PAVING
BELT COURSES
KEYSTONES
AIDS TO FENESTRATION
BALUSTRADES

1930-31

SPANDRELS
CHANCEL FURNITURE
BUSINESS BUILDING ENTRANCES
GARDEN SHELTERS
ELEVATOR DOORS
ENTRANCE PORCHES
PATIOS
TREILLAGE
FLAGPOLE HOLDERS
CASEMENT WINDOWS
FENCES OF WOOD
GOTHIC DOORWAYS
BANKING-ROOM CHECK DESKS
SECOND-STORY PORCHES
TOWER CLOCKS



St. Mark's, Mt. Kisco, N. Y.
Bertram G. Goodhue



Chantry in St. Thomas's, New York City
Bertram G. Goodhue

St. Bartholomew's, New York City
Mayers, Murray & Phillip





*St. Joseph's Chapel, Church of St. Vincent-Ferrer,
New York City. Bertram G. Goodhue*



*Church of the Ascension, New York City
Stanford White*

*St. Martin's, Providence, R. I.
Bertram G. Goodhue*





Chapel of the Beloved Disciple, Church of the Heavenly Rest, New York City. Mayers, Murray & Phillip



*Church of the Heavenly Rest, New York City
Mayers, Murray & Phillip*

*Church of the Holy Child Jesus, Richmond Hill, N. Y.
Henry V. Murphy*





Hyde Park Community M. E. Church, Cincinnati, Ohio. Granger & Bollenbacher



Wilmette M. E. Church, Wilmette, Ill. Granger & Bollenbacher

The City Church, Gary, Ind. Granger & Bollenbacher





*Chapel, St. Louis House of Retreats, Whitehouse, Mo.
O'Meara & Hills*

*St. Ambrose Chapel, Cathedral of St. John the Divine,
New York City. Carrère & Hastings*



*St. Brigid's, Westbury, Long Island
F. Burrall Hoffman*

*St. Mary's Chapel, Bishop's School for Girls, La Jolla,
Calif. Carleton Monroe Winslow*





*St. Xavier's Chapel, Cathedral of St. John the Divine,
New York City. Heins & La Farge*



*St. Mary of the Angels, Hollywood, Calif.
Carleton Monroe Winslow*

*Trinity Lutheran Church, Detroit
W. E. N. Hunter Company*

*Holy Cross Chapel, Worcester, Mass.
Maginnis & Walsh*





Trinity Chapel, West 25th Street, New York City
Hobart Upjohn

Russian Altar, St. Augustine's, New York City
F. deLancey Robinson



Church of the Paulist Fathers, New York City
Austin D. Jenkins, with Jenney, Mundie & Jensen
Chapel, St. Augustine's, New York City
Wilson Potter





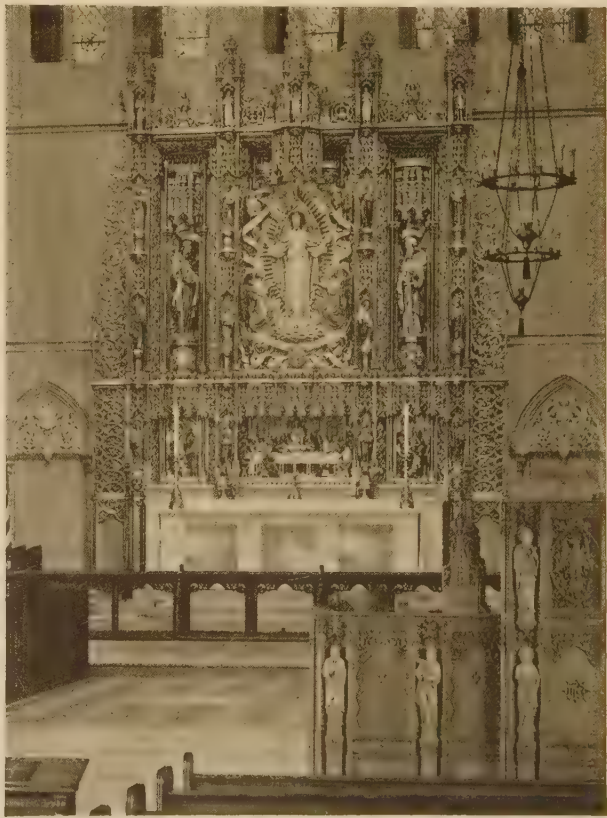
All Angels, New York City
John B. Snook Sons

*All Souls Memorial Chapel, Trinity Church,
New York City. Thomas Nash*



Trinity Church, New York
Richard Upjohn

St. James's Church, New York City
Cram & Ferguson





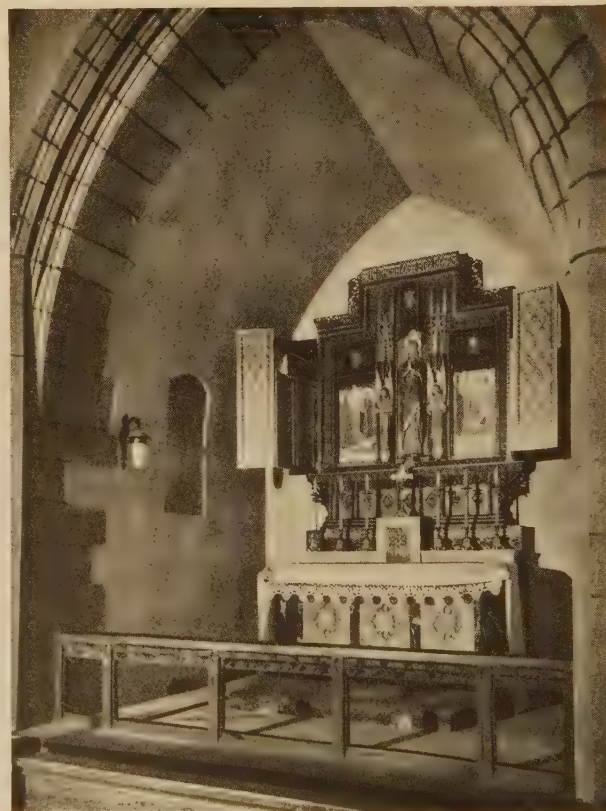
Chapel of the Intercession, New York City
Bertram G. Goodhue



Trinity Church, Moorestown, N. J.
Walter T. Karcher & Livingston Smith

*Side Chapel, Chapel of the Intercession,
New York City. Bertram G. Goodhue*

*Blessed Virgin Mary Altar, St. Andrew's,
Drexel Hill, Pa. George I. Lovatt*





Church of the Most Precious Blood of Our Lord, Philadelphia. George I. Lovatt



Christ Lutheran Church, Hazleton, Pa. Thomas, Martin & Kirkpatrick

Chapel Altar, Cincinnati, Ohio. Stanley Matthews, architect; Thomas T. Waterman, designer

Trinity Reformed Church, Akron, Ohio Fulton & Sons; Paul Forey, woodcarver





*Donnelly Memorial Chapel, St. John's Convent,
Swampscott, Mass. Matthew Sullivan*

*St. Mary's, Taunton, Mass.
Matthew Sullivan*



*St. Stanislaus', Troy, N. Y.
Edward W. Loth*

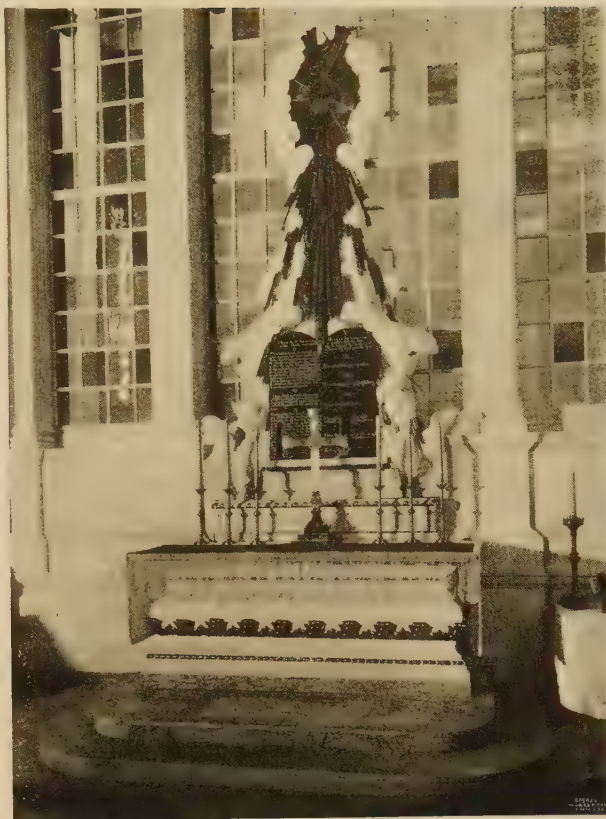
St. Dymphny, Gheel, near Antwerp





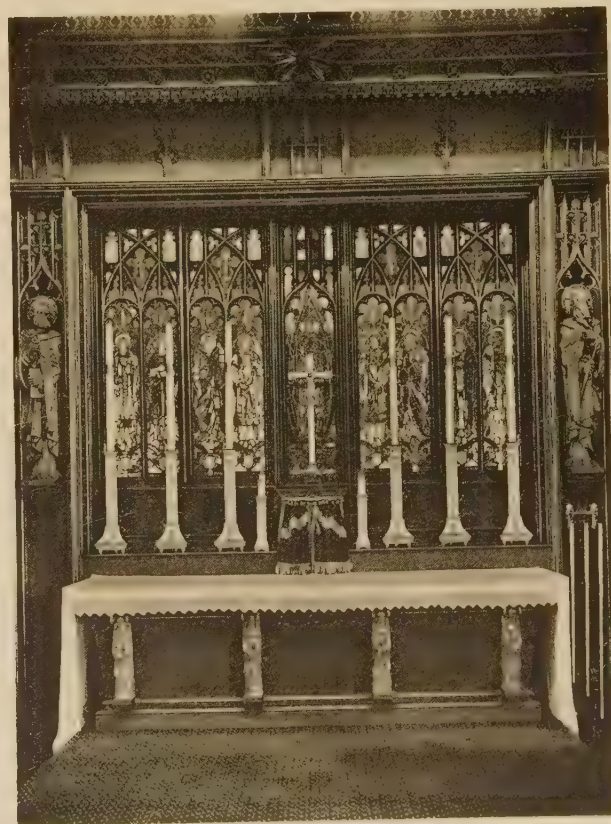
*St. Catherine's, 1524-1546, Hoogstraeten,
near Antwerp*

*Side Chapel, Church of St. Peter and St. Paul,
1670-1677, Malines, Belgium*



*St. Paul's, New York City
F. deLancey Robinson*

*Church of the Blessed Sacrament, Walpole, Mass.
Matthew Sullivan*





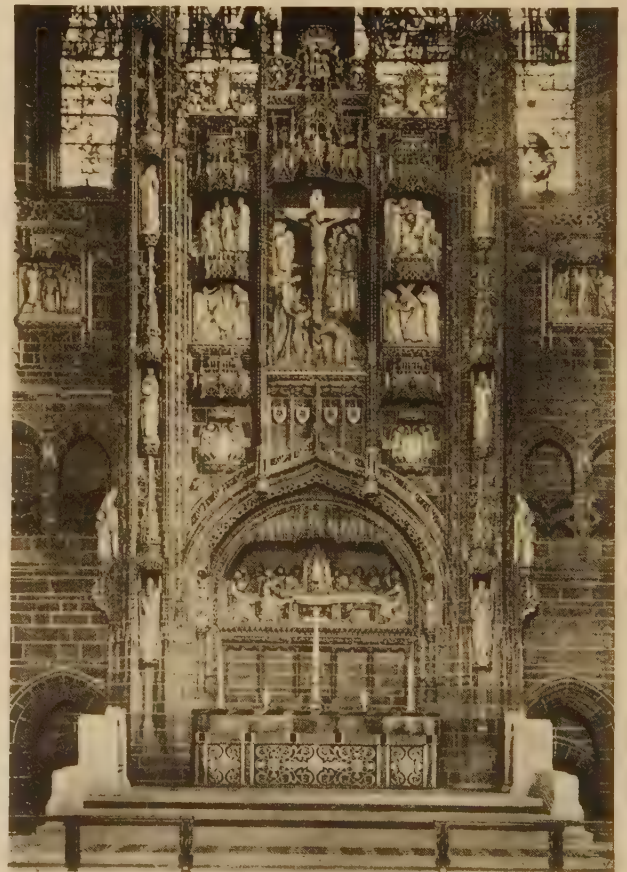
*Zion Episcopal Church, Douglaston, Long Island
Aubrey B. Grantham*

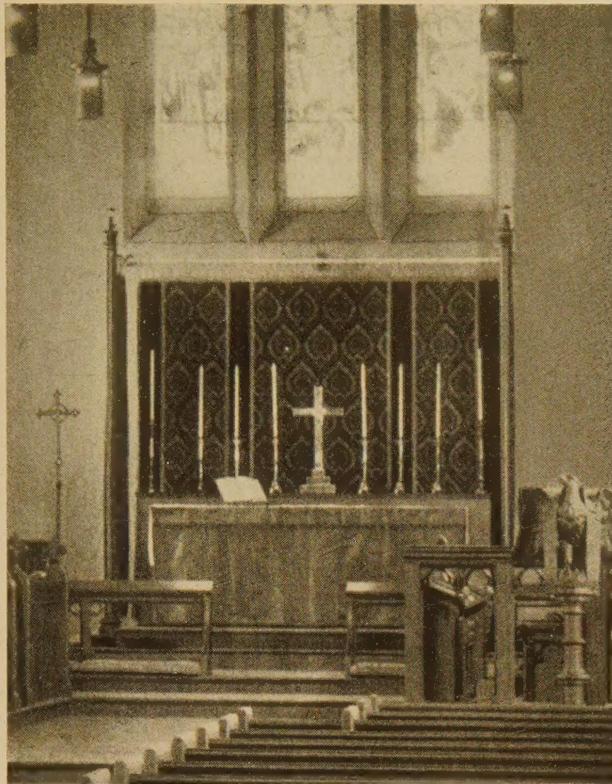
*St. Francis de Sales Church, Philadelphia, Pa.
Henry D. Dagit & Sons*



*Church of the Transfiguration of Our Lord,
Philadelphia, Pa. Henry D. Dagit & Sons*

Liverpool Cathedral: Sir Giles Gilbert Scott



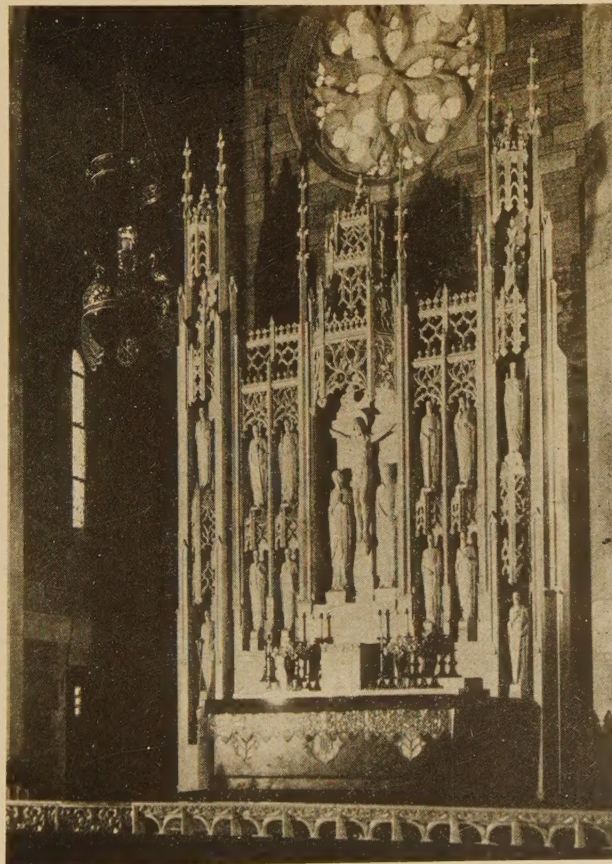


*St. Paul's Episcopal Church, Yonkers, N. Y.
Cram & Ferguson*

*Holy Cross Church, Germantown, Pa.
Henry D. Dagit & Sons*



*St. Madeleine's Chapel, Germantown, Pa.
Henry D. Dagit & Sons*

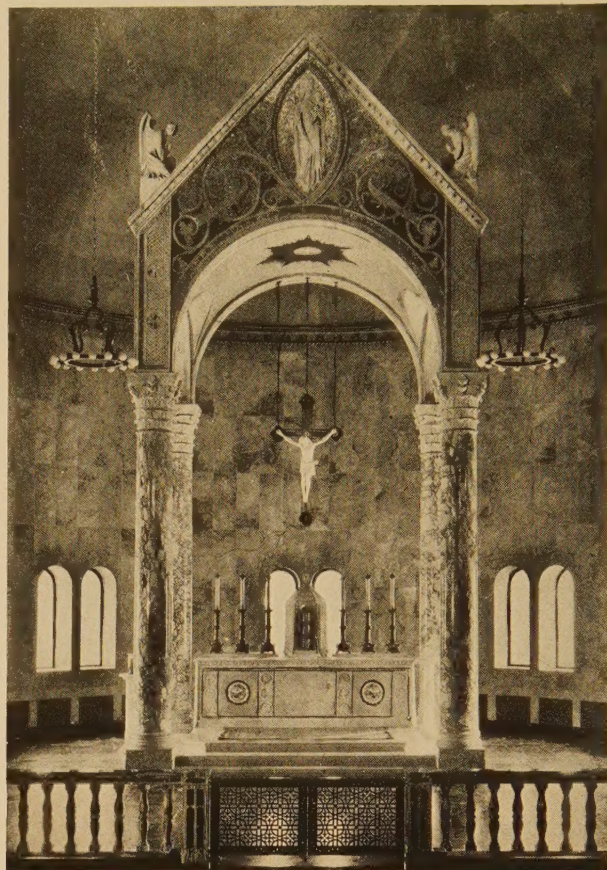


Blessed Virgin Mary Altar, Church of the Transfiguration, Philadelphia, Pa. Henry D. Dagit & Sons





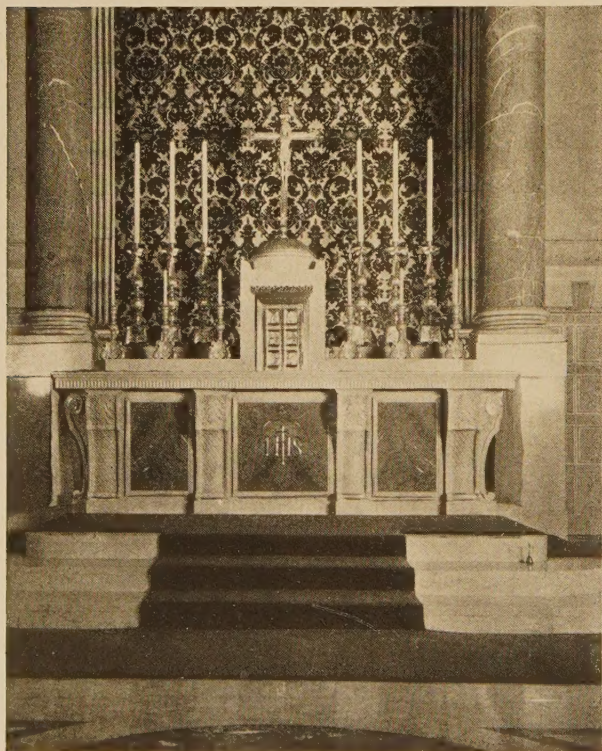
*Wernersville Chapel, Wernersville, Pa.
Maginnis & Walsh*

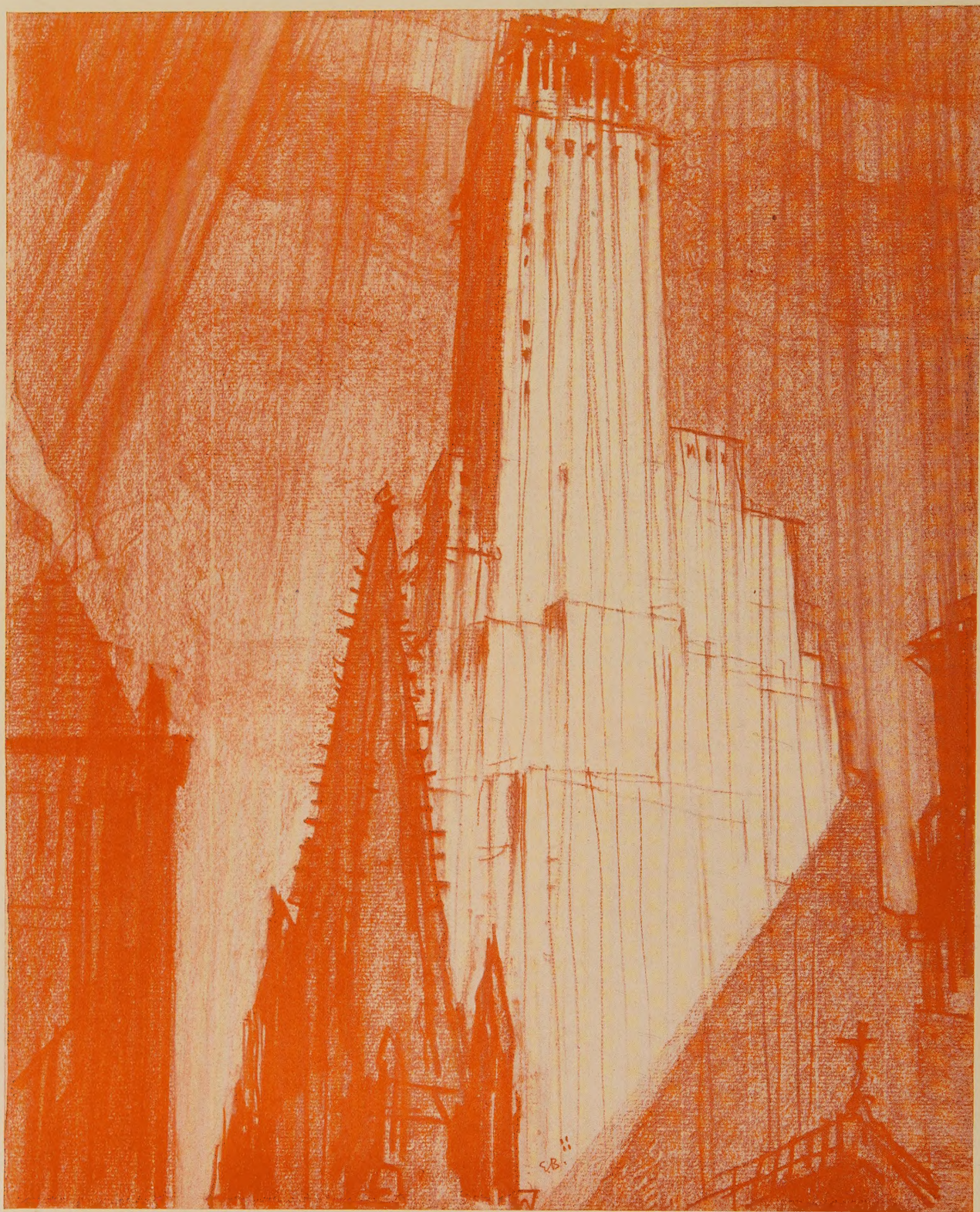


*Trinity College Chapel, Washington, D. C.
Maginnis & Walsh*

*Detail of the altar shown above
Maginnis & Walsh*

*Nazareth Hall, St. Paul, Minn.
Maginnis & Walsh*





IRVING TRUST BUILDING, 1 WALL STREET, NEW YORK VOORHEES, GMELIN & WALKER, ARCHITECTS
From the drawing in sanguine by ERNEST BORN